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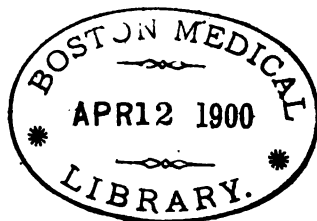
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*SESSION OF 1897*

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 Morris, J. C., 1514 Spruce  
 Morrison, W. H., Main, Holmesburg  
 Morton, T. S. K., 1506 Locust  
 Morton, G. D., 3001 West York  
 Moss, Wm., Main and Chestnut av., Chest-  
 nut Hill  
 Moulton, A. K., Pa. Hosp. for Insane

Moylan, Peter F., 1005 N. 6th  
 Muehleck, G. A., 1320 S. 5th  
 Müller, A. F., 4753 Green, Germantown  
 Musser, J. H., 1917 Chestnut  
 Musson, Emma E., 258 S. 16th  
 Myers, Talleyrand D., 1703 Locust

Nash, Jos. D., 1316 N. 11th  
 Nassau, C. F., 1515 Wallace  
 Neel, H. A. P., 3602 Washington, Tacony  
 Neff, Jos. S., 2300 Locust  
 Neilson, Thos. R., 122 S. 17th  
 Neuber, S. T., 1855 Frankford av.  
 Newbold, H. A., 3907 Walnut  
 Newcomet, Wm. S., 3229 Powelton av.  
 Nightingale, H. B., 247 N. 6th  
 Noble, C. P., 1637 N. Broad  
 Noble, W. H., 2101 N. 13th  
 Nock, T. O., 2507 Brown  
 Nolan, Edward J., 825 N. 20th  
 Numbers, W. A., 838 N. 24th

O'Daniel, A. Allison, 1319 Walnut  
 O'Farrell, G. D., 2317 E. Cumberland  
 O'Hara, Michael, 31 S. 16th  
 O'Hara, Michael, Jr., 125 N. 17th  
 Oliver, Chas. A., 1507 Locust  
 O'Malley, J. M., 1104 Jackson  
 Ott, Lambert, 1531 N. 17th  
 Owen, John J., 411 Pine

Packard, Francis R., 324 South 19th  
 Packard, F. A., 110 S. 18th  
 Packard, John H., Hotel Stenton  
 Paist, Henry C., 536 N. 7th  
 Pancoast, J. Wm., 1611 N. 13th  
 Pardee, Howard A., 3410 Baring  
 Parish, Wm. H., 1435 Spruce  
 Parnell, C. N., 132 S. 18th  
 Parke, Wm. E., 1739 N. 17th  
 Parvin, Theoph., 1626 Spruce  
 Pascoe, Geo. Y., 1921 N. 8th  
 Pearce, F. S., 1407 Locust  
 Pearson, J. S., 1507 Christian  
 Pennebaker, Benjamin, 4862 Tacony  
 Pennock, Walter J., 1407 N. 17th  
 Penrose, Chas. B., 1331 Spruce  
 Pepper, Wm., 1811 Spruce  
 Perkins, F. M., 1428 Pine  
 Perrine, E. K., 1809 Chestnut  
 Peter, L. C., 2136 Oxford  
 Phillips, John L., 2215 Tloga  
 Phillips, R. J., 123 S. 39th  
 Piersol, G. A., S. E. Cor. 48th and Chester av.  
 Pilkington, H., 4238 Paul, Frankford  
 Pitfield, R. L., 5450 Main, Germantown  
 Porter, Wm. G., 1118 Spruce  
 Posey, Wm. C., 1831 Chestnut  
 Potsdamer, J. B., 1333 Franklin  
 Pottberg, C., 2338 N. Broad  
 Potts, B. H., 1012 Spruce  
 Potts, Charles S., 1712 Wallace  
 Price, Joseph, 241 N. 18th  
 Price, M., 1335 Spring Garden  
 Pyle, W. L., 1831 Chestnut

Radcliffe, McCluney, 711 N. 16th  
 Ramsay, Alex., 103 E. Lehigh av.  
 Randall, B. A., 1806 Chestnut

Ransley, A. W., 1222 S. 10th  
 Raynor, N. H., 718 S. 10th  
 Rea, S. L., 856 N. 19th  
 Reckefuss, Chas. H., Jr., 506 N. 6th  
 Reed, Al. G., 228 N. 12th  
 Reed, W. P., 1403 S. Broad  
 Reeves, J. Howard, 1507 Walnut  
 Regar, H. K., 1509 N. 13th  
 Rehfuß, Emil G., 1316 S. Broad  
 Rehm, V. G. R. J., 2008 Master  
 Reynolds, Anna M., 1534 Dauphin  
 Reynolds, J. P., 705 Spruce  
 Rhein, J. H. W., 1320 Spruce  
 Rhoads, Edward G., 131 W. Chelton av., Germantown  
 Rhoads, J. Neely, 1612 S. 7th  
 Richardson, Ida E., 256 S. 16th  
 Riesman, David, 801 N. 6th  
 Ring G. Oram, 1442 N. 13th  
 Risley, Samuel D., 1722 Walnut  
 Roberts, J. B., 1627 Walnut  
 Robertson, W. E., 912 N. 4th  
 Robinson, Wm. D., 2012 Mount Vernon  
 Rocap, W. A., Olney  
 Roderer, John F., 2446 N. 6th  
 Rosenthal, Edwin, 517 Pine  
 Ross, G. G., 637 N. 16th  
 Roussel, Albert E., 2112 Pine  
 Rudderow, Francis, 423 S. 15th  
 Rugb, J. Torrance, 1431 Walnut  
 Runkle, W. V., 1605 Christian  
 Ruoff, Wm., 1318 N. 6th  
 Sajous, Charles E., 2043 Walnut  
 Salinger, J. L., 1510 N. 8th  
 Santee, E. I., 532 N. 6th  
 Schaffer, Charles, 1309 Arch  
 Schamberg, J. F., 831 N. Broad  
 Schneideman, T. B., 112 S. 18th  
 Schoales, Charles B., 1428 N. 11th  
 Schweinitz, George E. de, 1401 Locust  
 Schwenk, P. N. K., 827 N. 7th  
 Scott, J. A., 128 S. 18th  
 Scull, Wm. B., 3036 Richmond  
 Seabrook, Alice M., 2301 S. Broad  
 Seiss, Ralph W., 213 S. 17th  
 Seltzer, C. J., 1410 Walnut  
 Seltzer, Charles M., N. W. Cor. 19th and Spring Garden  
 Service, Charles A., City Line and Belmont av., Bala  
 Sharp, L., 1335 Pine  
 Shea, Wm. Ker, 1706 N. 18th  
 Sheets, John, 1324 Spring Garden  
 Shellenberger, J. R., 5505 Main, German-town  
 Shober, J. B., 112 S. 17th  
 Shoemaker, George E., 3727 Chestnut  
 Shoemaker, J. V., 1519 Walnut  
 Shute, H. A., 2145 Howard  
 Simes, J. H. C., 2033 Chestnut  
 Simsohn, Joseph S., 909 Franklin  
 Sinexon, Justus, 201 N. 20th  
 Sinkler, W., 1606 Walnut  
 Skidelsky, R. S., 514 Spruce  
 Skillern, P. G., 241 S. 13th  
 Skillern, Samuel R., 3509 Baring  
 Skilling, M. J., 1635 Christian  
 Slaughter, C. H. P., 10th and Wharton

Slocum, H. A., 1427 Walnut  
 Smith, A. D., 6019 Germantown av.  
 Smith, L. S., 133 S. 18th  
 Smith, S. MacC., 1502 Walnut  
 Smock, L. P., 3330 Chestnut  
 Snively, I. Newton, 2501 Oxford  
 Somers, L. S., 3554 N. Broad  
 Sparks, Geo. W., 1022 Spruce  
 Spellissy, Jos. M., 108 S. 18th  
 Spencer, G. W., 1838 Christian  
 Stahl, B. F., 1502 Arch  
 Staller Max, 631 Catharine  
 Steinbach, L. W., 1309 N. Broad  
 Stelwagon, H. W., 223 S. 17th  
 Stengel, Alfred, 332 S. 17th  
 Stern, Max J., 711 Franklin  
 Stevens, E. W., 1224 Walnut  
 Stewart, A. H., 252 N. 12th  
 Stewart, D. D., 108 S. 17th  
 Stewart, Wm. S., 1801 Arch  
 Stillé, Alfred, 3900 Spruce  
 Stone, Edward R., 1701 Master  
 Stone, James F., 1806 Green  
 Stout, E. J., 2422 N. Broad  
 Stout, Geo. C., 34 S. 18th  
 Stout, O., S. W. Corner 5th and Glenwood av.  
 Strawbridge, Geo., 202 S. 15th  
 Strecker, H. A., 333 S. 12th  
 Stritmatter, I. P., 999 N. 6th  
 Strobel, John, 948 N. 5th  
 Strouse, Fred. M., 2220 N. Broad  
 Styer, Charles, 1740 Columbia av.  
 Summers, S. Lewis, 309 W. Susquehanna av.  
 Sweet, W. M., 1131 Spruce

Talley, F. W., 1346 Spruce  
 Taylor, Charles F., 1520 Chestnut  
 Taylor, John J., 3709 Brown  
 Taylor, J. Madison, 1504 Pine  
 Taylor, Wm. J., 116 S. 18th  
 Taylor, Wm. L., 1340 N. 12th  
 Taylor, A. E., 334 South 16th  
 Teller, Wm. H., 1934 Green  
 Thomas, Chas. H., 1633 Locust  
 Thomas, F. W., 6 Mount Airy av., German-town  
 Thomas, George P., 2121 N. 7th  
 Thomson, Archibald G., 1426 Walnut  
 Thomson, Wm., 1426 Walnut  
 Thorington, James, 120 S. 18th  
 Thornton, E. Quin, 922 Spruce  
 Toboldt, A. L. A., 822 N. Broad  
 Trautmann, B., 242 Franklin  
 Trojano, Giovanni, 733 S. 10th  
 Tucker, Henry, 19 S. 21st  
 Tull, M. G., 4807 Woodland av.  
 Tunis, Joseph P., 129 S. 18th  
 Turnbull, C. S., 1719 Chestnut  
 Turner, John B., 1525 Christian  
 Tyson, James, 1506 Spruce  
 Tyson, T. Mellor, 1506 Spruce

Updegrove, Silas, 804 Marshall

Vanderslice, E. S., 127 S. 5th  
 Vandyke, Edward B., 306 S. 10th  
 Van Harlingen, A., 117 S. 18th  
 Vansant, E. L., 1929 Chestnut  
 Veasey, C. A., 47 N. 17th

- Walk, James W., 737 Corinthian av.  
 Walker, Gertrude A., 125 S. 16th  
 Walker, Jas. B., 1617 Green  
 Wallace, C. H., 4600 Kingsessing av.  
 Walmsley, J. W., 1003 Spruce  
 Ward, E. Tillson, 843 S. 3d  
 Warder, C. B., 1305 N. Broad  
 Warder, Wm. H., 1212 N. Broad  
 Watson, Arthur W., 126 S. 18th  
 Watson, Edward W., 131 N. 20th  
 Watson, W. N., 2847 N. Front  
 Webb, Wm. H., 556 N. 16th  
 Weintraub, Sarah L., 1511 S. 9th  
 Welch, W. M., 821 N. Broad  
 Wells, J. R., 5138 Lancaster av.  
 Wells, P. F., 4023 Brown  
 Wells, W. H., 333 Pine  
 Wendell, W. G., 4126 Chester av.  
 Werner, Marie B., 1514 Arch  
 West, John W., 1125 Wallace  
 Westcott, T. S., 108 N. 19th  
 Wetherill, H. M., 2208 Locust  
 Wetherill, H. E., 3724 Walnut  
 Wharton, H. R., 1925 Spruce  
 Wheeler, E. B., 1918 N. 8th  
 Whelen, Alfred, 1814 S. Rittenhouse Square  
 White, J. Wm., 1810 S. Rittenhouse Square  
 Wightman, J. G., 2030 Wallace  
 Wiley, Eugene, 330 Reed  
 Wiley, Harry E., 330 Reed  
 Willard, DeF., 1601 Walnut  
 Williams, C. B., 1226 Spruce  
 Williams, Horace, 1717 Pine  
 Williams, H. L., 112 S. 18th  
 Willits, Charles H., 24 S. 18th  
 Willits, I. P., 6135 Germantown av.  
 Willits, Mary 1705 Mt. Vernon  
 Willson, H. Aug., 1611 Spruce  
 Wilson, Jas. C., 1437 Walnut  
 Wilson, R., 403 S. 22d  
 Willson, Samuel M., 1517 Arch  
 Willson, W. Reynolds, 112 S. 20th  
 Wirgman, Chas., 2021 Pine  
 Wise, George G., 420 S. Broad  
 Witmer, A. F., 332 S. 15th  
 Wolfe, Sam., 1701 Diamond  
 Wolff, Lawrence, 333 S. 12th  
 Wood, Alfred C., 1501 Walnut  
 Wood, H. C., 1925 Chestnut  
 Woodbury, Frank, 218 S. 16th  
 Woods, D. F., 1501 Spruce  
 Woods, Matthew, 1307 S. Broad  
 Woods, Walter V., 836 N. 40th  
 Woodward, O., Willow Grove ave, Chestnut Hill  
 Wray, W. S., 1224 N. 7th  
 Yard, John L., 327 S. 18th  
 Yarrow, T. J., 1335 N. Broad  
 Yeager, Frank N., 2400 Oxford  
 Young, I. G., 1000 Shackamaxon  
 Young, J. K., 222 S. 16th  
 Zentmayer, Wm. J., 1423 Walnut  
 Ziegler, S. L., 1509 Walnut  
 Ziegler, Wm. H., 3028 Frankford av.  
 Ziegler, W. M. L., 1418 N. 17th  
 Zimmerman, N. W., 1633 Chestnut  
 Zuill, W. L., 857 N. Broad

## HONORARY MEMBERS

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Browne, Lennox,	London, England.
Eskridge, J. T.,	Colorado Springs.
Kerr, John G.,	Canton, China.
Pavy, Frederick W.,	London, England.

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## DECEASED MEMBERS, 1897

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Harrison Allen, M.D.  
William A. Carey, M.D.  
Joseph F. Edwards, M.D.  
Peter D. Keyser, M.D.  
William H. Pancoast, M.D.  
Anthony E. Stocker, M.D.  
Samuel N. Troth, M.D.  
George W. Vogelar, M.D.  
J. E. Whiteside, M.D.

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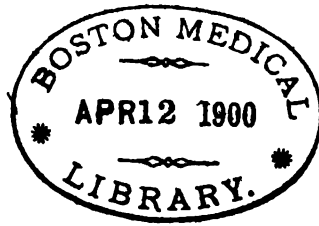


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## A NUMBER OF APPLIANCES FOR ELECTRIC LIGHTING.

THOMAS S. K. MORTON, M.D.

[Exhibited January 13, 1897.]

### Dr. Thomas S. K. Morton demonstrated A NUMBER OF APPLIANCES FOR ELECTRIC LIGHTING..

These consisted of several lamps permitting connection with the ordinary current as obtained from the street or from a storage battery. A head-lamp with a reflector was capable of giving, with a sixteen-candle-power incandescent loop, a light of fifty-candle-power, and was especially commendable for its lack of weight. It could be used for various operative purposes and by nurses and others on night duty in hospitals and elsewhere. It was also available for reading or other work of like character. The apparatus was provided with a neat, simple and satisfactory switch upon the right side of the head-band. The lamp itself was easily removable from its frame. An-

other light was enclosed in a small bulb of glass surrounded in turn by a second bulb, and between the two there flowed constantly a current of cool water supplied by means of two rubber reservoirs at different levels. By lowering one or the other reservoir alternately, keeping the one filled with water the higher, a constant current of water could be kept passing around the inner bulb, which in this way is kept constantly cool and can be introduced into any cavity of the body without causing pain or doing harm. An ordinary controller can be employed for governing the current, easily cutting it off when not needed and establishing the connection when the current is desired. The apparatus has been devised by Dr. Nevius, of Chicago. The manufacturers have also constructed a storage-battery weighing only fifteen pounds, capable of yielding a light of eight-candle-power for fifty hours.

## A CASE OF EXCISION OF THE HEAD OF THE RADIUS FOR OLD DISLOCATION.

Dr. T. S. K. Morton exhibited

### A CASE OF EXCISION OF THE HEAD OF THE RADIUS FOR OLD DISLOCATION.

The case occurred in a woman, forty-two years old, who had been kicked by a horse some eight months before coming under observation. When seen, the head of the radius protruded prominently beneath the skin above and to the outer side of the joint, and extension and flexion, and pronation and supination, were greatly interfered with. There was much pain in the arm from pressure upon the musculo-spiral nerve and there were also pains referred to the distribution of other branches of the brachial plexus. It being evident that manipulation could not effect a reduction of

the dislocation, excision of the head of the radius was decided upon and carried out. The head was dissected free from its surroundings and cut off with a chisel above the attachment of the biceps tendon. The musculo-spiral nerve was involved in the adhesions and was set free before closing the incision. The wound healed by primary intention, and the result, surgically and functionally, was a perfect one. Complete power and perfect freedom of movement were restored, with relief of pain and without wasting, and ordinary examination was incapable of demonstrating any loss of bone, as the neck of the radius occupied the normal site of the head. The removed fragment exhibited erosion of the articular cartilage.

## A CASE OF VERY EXTENSIVE SKIN-GRAFTING AFTER THE METHOD OF THIERSCH.

Dr. T. S. K. Morton exhibited also

### A CASE OF VERY EXTENSIVE SKIN-GRAFTING AFTER THE METHOD OF THIERSCH.

A young man, twenty-six years of age, had the misfortune about a year ago, while walking in a boiler-room, to slip his left leg through an opening in the floor into a tank of boiling water. The member became caught in the tank, and remained in the water for a period of about thirty seconds before the man could be extricated by his companions. He was removed to the Polyclinic Hospital, and almost lost his life in the succeeding four weeks from exhaustion. The entire thickness of the skin sloughed from seven inches above the patella to the malleoli at the ankle, save a few small islets of epidermis, which remained upon the crest of the tibia. Before the sloughs had all come away, the leg had become flexed at a right angle with the thigh and was covered with very vascular granulation-tissue. At this time he was under the care of Dr. L. W. Steinbach, who, under ether, made forcible extension of the limb, and succeeded in bringing it out perfectly straight. The granulations, however, parted in the flexure of the knee-joint, and all of the ham-string tendons became exposed. Under the same anesthesia grafting with the skin of frogs was carried out. These grafts were placed upon the top of the granulations, but all failed to "take."

Some eight weeks after the accident Dr. Morton determined to apply extensive grafting after the method of Thiersch. The granulations were sterilized as well as possible by spraying with hydrogen dioxid diluted one-half with normal salt-solution (0.6 per cent. common salt in water), and were subsequently enveloped in gutta-percha tissue. When supuration had been largely controlled by this method, a surface some ten inches long and two inches wide was scraped forcibly with a curet. Bleeding was free, but was easily controlled by the binding on of sponges while the grafts were being cut. The skin of the opposite thigh, shaved and sterilized, was greased with a little boiled olive-oil. Then, with a razor ground flat on the under side and similarly greased, strips of skin were cut from its upper surface, the integument being held tense and slightly humped up by a hand above and one below the field from which the grafts were to be cut. These strips were cut about an inch wide and as long as possible. They much resembled wet tissue-paper. The razor was propelled by a gentle see-saw motion and not permitted to penetrate beneath the papillary layer of the skin. If fat is exposed it is proof that one has cut entirely too deeply;

only the superficial layers of the skin are required. The grafts, as cut, heap themselves up in long strips upon the razor-blade. These are then transferred, right side down, directly upon the surface to be grafted, by seizing the end of the strip at the edge of the razor, bringing it to the edge of the wound, and then gently drawing the razor away from this point in the direction of the surface that the graft is meant to cover.

If it is more convenient to cut a large number of grafts before beginning to apply them to the wound, they may be temporarily placed in a bowl of the warm salt-solution. It is essential that no antiseptics be used during the entire process of grafting and dressing, as such chemicals destroy the delicate cells of the grafts. Salt-solution alone should be used as an irrigant.

When the wound to be grafted has been gently covered with the strips of skin, slightly overlapping each other in all directions, the entire area is roofed over with strips of Lister protective or gutta-percha tissue, and a copious dressing of gauze wet with salt-solution placed outside. Over the whole a sheet of gutta-percha tissue is wrapped, and finally a wet gauze bandage is applied with moderate firmness.

All bleeding must be stopped before the grafts are applied. Prior to placing the dressing, the grafts must be gone over with some flat instrument, like a spatula, in order that air-bubbles, blood-clots, or whatever might prevent contact of the grafts with the wound-surface, may be squeezed out. The dressing is kept wet with salt-solution for forty-eight hours, when re-dressing should be done, and the surface sprayed gently with hydrogen dioxid in salt-solution (half and half), washed off with salt-solution and dressed as at first, save that now it is not necessary that the gauze should be kept wet.

By this process of Thiersch, repeated some dozen times in the course of a year by Dr. Morton and his colleagues, Drs. Roberts and Stern, the entire area of burn was gradually obliterated, so that now a true skin covers the whole area that sloughed away. It is even movable freely over the underlying tissues at all points and much elastic tissue has developed, so that upon the thigh and calf the skin can be raised an inch from the underlying surfaces. As no hair, fat, or sweat-glands are present in the transplanted skin, it is necessary for the patient to daily anoint the parts with a little purified lanolin or other unguent to prevent drying and cracking of the epidermis. Sensation has returned completely throughout the new skin. There is no contraction at the flexure of the knee-joint or

elsewhere, and, so far as appearances go, the leg is in perfect condition. The surfaces from which the large quantity of grafts were derived comprised the opposite thigh, the thigh upon the injured side above the burn, and both upper arms. These regions, especially the thigh, were able to yield successive crops of grafts at intervals of about six weeks, and at present appear to be in normal condition, save for slight discolorations. The hair is growing over them all as usual, proving that only superficial layers of skin were taken away. The surfaces healed over, as a rule, after taking grafts, in about two weeks. These raw surfaces were covered by strips of protective and a dry gauze dressing and bandage. Simple dusting with formaldehyd-gelatin, without other dressing, has also proved satisfactory.

Dr. Morton remarked further that this was the largest surface that he had ever attempted to graft, and the greatest area that had ever been successfully covered so far as he knew. The result proved that even extensive girdling ulcers of an extremity resulting from burn or other injuries present no insurmountable barriers to full healing. The case further demonstrated that great losses of integument can be repaired without being followed by disabling, painful, or unsightly contractions. Dr. Morton believes that no large granulating surface should be permitted to close spontaneously, if

by such healing contractions are liable to take place, for by the use of Thiersch grafts such results can usually be prevented.

DR. J. K. YOUNG said that it had been his privilege to see the patient in consultation with Dr. Morton and several other surgeons, and he viewed the result as in every way gratifying. At the time of the consultation there was a difference of opinion as to what was the preferable measure under the circumstances, and it was finally decided that grafting of skin by the Thiersch method should be tried. From personal observation in Rupprecht's Clinic, in Dresden, Saxony, Dr. Young was confident of the utility of this method, and he recommended the application to the wounds after the grafts had been applied by being washed off from the razor the dusting of a powder, consisting of equal parts of talcum, boric acid and zinc oxid.

DR. ERNEST LAPLACE said that the case demonstrated the superiority of the Thiersch method of grafting over other methods formerly in vogue. All that is required to check the granulating process is isolation of the surface from the air by means of epithelium, and this end is effected by means of the grafts. The case illustrates further what care and attention to detail and the correct application of true pathologic principles are capable of accomplishing.

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## CONCERNING THE TREATMENT OF CLUB-FOOT.

J. P. MANN, M.D.

[Read January 13, 1897.]

The conclusions of this paper are based on private and public work done during the last ten years, during which period I have seen and treated over five hundred cases of club-foot. The term club-foot is used here to embrace all varieties of foot-deformity. No adequate reason for limiting the term to the single variety of *talipes equino-varus* has thus far been presented.

The treatment of club-foot may be entirely mechanical, or both mechanical and operative. Prior to the commencement of the present century all remedial efforts were strictly mechanical. The

result in the majority of cases was but a partial cure, obtained at great expense of time and patience to both patient and physician. It is common knowledge that, after many months of mechanical treatment by Sheldrake, Lord Byron became disgusted and abandoned further curative attempts.

With the introduction of tenotomy, mechanical appliances were almost entirely set aside in practice, and again partial cure became the rule. Quite recently, with the advent of clean surgery, and with the intelligent employment of both mechanical and operative measures

for relief, the treatment of club-foot has reached a rational basis. To-day, when cases are seen sufficiently early, few surgical procedures are as exact in indication or as certain in result as the methods for rectifying club-foot.

The initial step, in correcting any congenital club-foot, is to adopt, at birth, the mechanical plan of treatment necessary to bring about either a complete, or, when this is impossible, a partial cure. If only a partial cure obtains, the appliances, while aiding to accomplish this, have entirely prevented increase of deformity, which without their use would have ensued; and also, the surgeon has thereby been enabled to await the arrival of the proper time for operative interference. Mechanical correction may be effected by the hands; by elastic and other bands; by plaster of Paris and other stiff materials; by various shoes, splints and steel mechanisms, or by leverage, called by some "forced" correction. The selection of a mechanical method of cure, in any case, is largely determined by parental intelligence, accessibility and physical condition of the patient and by the degree and stubbornness of the deformity. Some feet can be straightened by manual effort alone; others, during their course of treatment, will require, along with manipulation, suitable retentive apparatus. The various appliances and their right usage are so well understood and agreed to that they will not be considered at greater length. It is, however, very important that the physician, after a careful study of the case, should decide for himself what apparatus is necessary to a cure. It is just as improper for the instrument-maker to determine the mechanical treatment of a case as it is for him to select and direct operative measures. Frequently the instrument-maker, for the time being a self-constituted physician, will prescribe, *e. g.*, for an active tuberculous arthritis a brace that affords free motion to the joint and a splendid opportunity for amputation at a little later period.

Many club-feet are not seen by the surgeon until the deformity is so fixed, so unyielding that both mechanical and operative interference are requisite for a

cure. In this article I shall devote greater attention to operative than to mechanical measures, because the injudicious choice of operative procedure may render an operable foot entirely inoperable—a very serious error, which the inconsiderate selection of apparatus could hardly bring about.

Perhaps a clearer understanding of this part of the subject will be secured by discussing the questions: At what age is it best to operate? Shall the operation be open, irrespective of the removal or non-removal of bone, or shall it be subcutaneous? and, What is the post-operative treatment of club-foot?

I believe that no *congenital club-foot* should be operated on until the child has learned to walk, *i. e.*, usually from the twelfth to the twentieth month after birth. With skilful manipulation, and, if necessary, retentive apparatus, many cures can be effected when there is slight deformity. Severe cases, however, require, beside operation, mechanical treatment, both previous and subsequent thereto.

Some children with club-foot are not of robust build and may become victims to one or other of the maladies of infancy, and thus early operations may be rendered useless. Why add shock from operation and anæsthetic to the already too long gauntlet of children's enemies? Mechanical treatment, judiciously selected and applied, will never cause death. An operation, however skilfully performed, may be "the last straw" under which the little one sinks into an early grave.

When a child can walk, in addition to suitable apparatus, its body-weight very materially contributes to the retention of the foot in its correct position. A pressure of from fifteen to thirty pounds controlled by mechanisms, constantly, acting while the patient stands erect, is without doubt a powerful corrective agent. Further, it must not be forgotten that many cases are assisted to a cure by properly directed muscular action. The infant's foot is so small and the tissues are so tender that often with operations done too early, unless the surgeon can frequently see the part, and

the parents are more painstaking and intelligent than usual, it is very difficult to avoid either partial or complete relapse, even when apparatus is worn. The failures, one excepted, that I have witnessed resulted from operating too early or from neglect of treatment, or they occurred when open section was done. In the excepted case a concurrent scarlet fever—which began a day or two after operation—necessitated the cessation of further efforts to correct the club-foot.

Shall the operation be *open*, with or without removal of bone, or *subcutaneous*? Krauss, Wolff, Bradford, Lovett, Lorenz, Young, Lewis and Reginald Sayre, Allis and others affirm that any club-foot needing operative measures for its correction, in child or adult, can be rectified by subcutaneous section of the soft tissues, aided by force and proper retentive appliances. This is a strong and, as I believe it to be, a correct statement.

I will quote from H. A. Wilson's paper<sup>1</sup> on "Bone-operations for the Correction of Club-foot":

Shaffer, replying to the question, How many bone-operations have you performed for the cure of club-foot? says: "If your query was 'How many cases have you had which have been condemned to osteotomy and which you have cured without operation?' I could give you some statistics."

Lorenz says: "I consider every bone-operation, in club-foot, as a mutilation of the foot and as a criminal act to the practice."

Lewis Sayre writes: "I have seen only two cases which I could not correct without this procedure. I gave one of these cases to Dr. Stephen Smith and the other to Dr. E. Mason. One had amputation done subsequently, and the other died of septicemia."

Wilson remarks, in the paper before mentioned: "I have been unable to ascertain the grounds for selecting bone-operations in preference to other well-known and equally reliable procedures prior to the age of eight and twelve years, at which time it is presumed that

the bones of the foot are firmly ossified and unyielding." Again he says: "A very large majority, if not all," cases of club-foot "could be corrected by soft-structure section, either with manual or mechanical stretching and tearing and proper post-operative treatment."

Many orthopedic surgeons, who, when they deem it necessary, operate upon the soft structures by open section, strongly condemn the removal of bone except in the rare cases in which other methods have failed.

Willard, replying to a personal question, said: "My typical results are secured in those cases corrected without the removal of bone, and I find it unnecessary to remove any bone except in cases in which the dislocated head of the astragalus is too large to be returned to its normal position. The dimensions of the bone are readily determined on exposing the foot to the X-rays."

It is certainly a mistake to say that the bones will not yield to "forced correction," after the twelfth year, for the ages of many of the most marked and stubborn cases of deformity, in my experience, varied from the twelfth to the twenty-fifth year, and in straightening such feet the bones were literally molded into the desired position.

Krauss says: "(1) The different methods of resection of the tarsus impair the form of the foot and the stability of its osseous arch, with a consequent impairment of mobility and usefulness; (2) Resection as an operation is not free from risk; (3) The extirpation of the astragalus is a more suitable operation for restoring the form of the foot than the removal of a wedge in the direction of the medio-tarsal joint; but it leaves an immovable ankle, or one partly so, a weak union between the os calcis and the second row of tarsal bones, and serious shortening of the foot; (4) Resection removes all chance of future restoration by orthopedic treatment; (5) There is no conceivable form of club-foot in which tarsal resection is justifiable, except it be in the case of one that is persistently painful in an old subject and in which there is no possible prospect of a good result from orthopedic treatment. In such a

<sup>1</sup> Reprint from the Transactions of the American Orthopedic Association, September, 1893.

case resection may be fairly tried instead of amputation."

Hence, with quite divergent views as to the best plan for dividing the soft tissues of the foot, there is general agreement among orthopedic surgeons against the removal of bone.

It is not asserted here that open tenotomies and operations such as Phelps', or any of the seven methods of tarsal excision, will not straighten club-foot; but it is believed that the section of the soft tissues can be accomplished with less risk of sepsis, less mutilation of the foot, less pain to the patient, without any exposed cicatrices and with greatly decreased post-operative contraction; thus insuring, if these claims be just, a stronger, more shapely and more useful foot than is obtained by open operations. I have experienced no difficulty from inability to identify structures beneath the skin, from failure of tendons to unite, or from loss of time. Nor have I seen a single case of sepsis in subcutaneous operations for club-foot. Any surgeon who neglects strict aseptic precautions is incompetent to operate on a club-foot or anything else. It is far more likely that sepsis will occur in a Phelps operation, in which a large wound is left open to granulate and the clot to organize, than that septic matter will enter the tissues through a minute opening in the skin which will close and practically heal in twenty-four hours.

I have not infrequently seen infection occur in open wounds, when for relief from pain and in order to control the septic process, it became necessary to remove all restraining apparatus: and the result was the return of the foot into a position less useful, more deformed and less operable than before treatment was instituted. When sepsis appears in a wound, after subcutaneous operation, it is just as readily opened and cleansed as is an open section, which—owing to post-operative symptoms—must, after having been sutured, be re-opened. *Does not every single wound that is thus sutured really become a subcutaneous operation?*

That there is less mutilation of the foot through operating subcutaneously

needs no discussion. No bone is removed, the skin and immediately sub-jacent tissues are not divided—so that, from the very nature of the case, the statement is true. Pain, after subcutaneous section, is infrequent, and when present is due mostly to pressure of restraining appliances. Of course, in subcutaneous sections, there are no tender and exposed cicatrices; they can exist only after open divisions. It is impossible to have such contractions as follow open operations because the skin and next underlying structures are not divided in subcutaneous procedures. Phelps severs all structures down to the bone, and others remove more or less bone. Such destruction and mutilation never take place by the subcutaneous method of treatment, and they are cruelly, unscientifically and needlessly inflicted in open plans of correction.

It is not difficult to identify, subcutaneously, structures requiring division; their names do not assist the competent operator to correct a deformed foot. Any soft structure maintaining the deformity must be divided by cutting and tearing, or be sufficiently elongated by stretching.

Only once have I seen an important vessel severed. The resulting hematoma told what had happened. The tumor was opened by Dr. Allis, whom I was assisting, the clot removed and the bleeding vessel was ligated. The wound was immediately sutured and the restraining apparatus was re-applied. The patient made an uninterrupted recovery and had a perfect correction of the foot.

Not a single tendon has failed to unite in any of my cases, and with properly instituted treatment such an accident must be very rare.

Subcutaneous operations do not require so much time for their performance, nor is their post-operative treatment so difficult or so extended as when open section is practised.

At infrequent times it is necessary to shorten a tendon. It is scarcely necessary to say that this must be done by open section.

What is the post-operative treatment of club-foot? Following operation, fixation of the foot in an over-corrected

position should be maintained, for about six weeks, by means of plaster-of-Paris bandages applied from the toes to just below the knee. The foot is thus molded and forced into the required position, and the bones and soft structures all yield to the continuously acting pressure of the rigid dressing. The plaster of Paris should be removed weekly in order to inspect the foot; for if this precaution be neglected, serious injury from pressure may take place. When changing the plaster dressings, if the correction has not been ample, opportunity is afforded for anesthetizing

the patient and using leverage for further correction of the deformity. This will be required in many severe deformities. Subsequent to treatment by "fixed" dressings a retaining shoe and brace must be worn. In marked deformities of children, the shoe and brace are worn until the child is twelve years of age; ossification is then completed. In adults the time will vary with the degree of deformity. After discarding apparatus, both children and adults should be kept under observation, and, if there is any tendency to a relapse, the supports should be at once reapplied.

### DISCUSSION.

DR. DE FOREST WILLARD said that he agreed with nearly all of the conclusions with regard to subcutaneous tenotomy and forcible stretching. These are usually sufficient to secure a proper position of the foot, and if followed by appropriate mechanical treatment for a number of years, they will result in a useful, flexible foot. The walking results will be satisfactory, even though there remain some inturning of the metatarsus in its relation to the tarsus. If the original deformity has been permitted to continue uninterfered with for ten or fifteen years, it becomes almost impossible to correct this obliquity by any manipulation save that of extreme force. In many cases there is actual dislocation and overlapping of adjacent metatarsal bones, as can be shown by a skiagraph. Under these circumstances it is impossible to entirely overcome the internal deviation. Internal rotation at the knees and hips also takes place, which will require much muscular practice to overcome.

When club-foot exists at birth manipulation should be begun at once. If the bones are permitted to grow in their abnormal shape during the first month of life a golden opportunity is lost.

In Dr. Willard's opinion the age for operation should be earlier than that fixed by Dr. Mann, viz.: rectification should be secured as soon as the child shows any tendency to walk, say from the ninth to the twelfth month, rather than after he begins to walk, say from the twelfth to the eighteenth month, as recommended by Dr. Mann. By bringing the foot into proper position the weight of the body assists in bringing about the cure. A child should never be permitted to walk with its feet in improper position.

Dr. Willard is disposed to avoid mutilating operations whenever possible, but when it be-

comes necessary he has no hesitancy in removing some portion of the tarsal arch. The surrounding conditions of the patient, as well as the condition of the feet, have something to do with the decision. For instance, in the case of a child from the country, untreated for a period of five, eight or ten years, whose parents take little interest in its welfare, if a partial cure only were secured the probability is strong that the child would return home and suffer an early relapse. Circumstances like these justify the placing of the foot in such a position that carelessness on the part of the parents or of the patient could not lead to an unsuccessful result or relapse, and removal of the astragalus would be allowable when it might not otherwise seem to be demanded. Even in adults tenotomy will often yield good results, but when a speedy cure is desired bone-operations are imperative in a certain number of selected cases. Under conditions like those already mentioned operation is not only justifiable but even necessary. With these exceptions multiple tenotomies, mechanical treatment, and forcible correction will ordinarily prove sufficient.

Dr. Willard rarely performs the same operation twice in succession, as each individual case requires the application of specific and definite means to accomplish a desired rectification.

DR. J. K. YOUNG agreed in many details with what Dr. Mann had said, but he took exception to others. He was misquoted as not approving of operation; for, while formerly having some doubt in the matter, he had come to look more favorably upon surgical interference and had performed all the accepted operations a sufficient number of times to decide their relative merits. If manipulation is begun at birth operation will often be unnecessary; should it still be required it can be de-

ferred to the age of six or twelve months. Multiple tenotomy is the operation of first choice when such interference is indicated. If it proves insufficient Phelps' operation is the next resort, astragalectomy is the third choice and tarsectomy the fourth. Dr. Young desired to retract some remarks he has made on several occasions against the justifiability of tarsectomy since he had met a case (the photograph of the cured condition of which he exhibited) in which this operation was not only justifiable but necessary. Such cases are exceedingly rare. After operation by tenotomy it is not necessary to remove the plaster before the expiration of two weeks. After the Phelps operation, in case the blood-clot of Schede is availed of, the dressing may be left unchanged for five or six weeks. Then, if the technic has been perfect, healing will be complete. The treatment after operation is quite as important as that before, and various forms of apparatus may become necessary. Apparatus may be sufficient in many cases without operation, but not in all. If a cure is not effected within one year by manipulation and appliances, operation should be resorted to.

DR. G. G. DAVIS pointed out that each case must be treated according to its specific indications. If a child's foot cannot be brought into a correct position by manipulation there can be no objection to tenotomy. Before the child has begun to walk manipulation, accompanied by splints, will usually bring about a cure without operation, but no evil will result from division of the Achilles tendon. This measure shortens and renders the treatment easier. As the child grows older it becomes less amenable to manipulative treatment. From the time it begins to walk to the period when the bones are hardened, say to the twelfth year, something more positive is often required in addition to simple splints or apparatus. At this time plaster of Paris is useful. After the tendons have been divided the foot is stretched to its utmost and fixed with plaster of Paris in its corrected position. The stretching may be repeated in the course of ten days and the dressing renewed; this may be done several times. When the foot has been brought into proper position it must be retained there by appropriate apparatus.

As the bones grow harder, sometimes it becomes impossible to straighten them, even by the means last named. The bones of the foot become distorted, the neck of the astragalus being bent inward; the foot is often turned inward at a right angle to its natural position, and even the contracted skin offers resistance to replacement by manipulation. Under these circumstances crushing appliances have been employed, but their use is rarely desirable. By grasping the foot with wet towels a very great amount of force can be exerted to twist the member into place. In case stretching and plaster of Paris fail, the next available measure is a matter for discussion. Dr.

Davis has found that in cases in which Phelps' operation, or astragalectomy, seemed indicated he was eventually able to succeed without resorting to either. Tenotomy, fixation with plaster of Paris and subsequent mechanical appliances usually sufficed. In failure of these recourse was had at once to resection of the tarsus. In several cases of this kind previously reported the results had been admirable. Some cases will yield only to radical correction; conservatism will entirely fail to relieve the pain and correct the deformity. In these severe cases the mere removal of the astragalus will not alone effect a cure. The tendency to relapse will remain. It will be necessary to divide the remaining portion of the tarsal arch. The practical end to be attained must always be kept in view. In the cases of the poor, the careless, the inattentive, in all those that cannot be kept under careful observation for considerable lengths of time, it becomes necessary to institute a form of treatment that will secure the desired result as speedily as possible, and more radical measures are allowable than would otherwise be the case.

DR. T. S. K. MORTON expressed gratification at the emphasis that had been placed upon the rejection of operation immediately or soon after birth. Such operations are likely to do more harm than good. At the same time, fourteen months seems a long period to routinely delay operation. The best time would appear to be when the child begins to manifest a desire or ability to walk. Subsequent to this period there is the advantage of the weight of the child standing and walking upon the corrected feet supported by braces, making the thrusts and strains take the proper direction. The statement that all cases of club-foot are capable of correction by manipulation or simple division of soft parts seems rather too broad. In cases that can be kept under observation from birth, correction can always be so effected. When, however, marked bony deformity exists, excision of bone becomes necessary. It is best in such cases, first, to excise the astragalus, and if then full correction be not established, to go on taking away portions of tarsus until the deformity is relieved. The records at the Orthopedic Hospital show the splendid results of this plan of procedure, which has been pursued for a period of some eleven years. The statement that it is "criminal" ever to cut bone, even in adults, for the correction of club-foot, is, to say the least, reckless. After resection has been practised the subsequent result depends largely upon the after-treatment—even more so, perhaps, than after tenotomy. The use of plaster of Paris is not entirely safe, and the recommendation to other than experts, to maintain forcible over-correction, is not free from danger. Unless this dressing be changed frequently there is considerable risk of sloughing and like complications from too severe



pressure upon the defectively nourished tissues that invariably go with club-foot.

DR. ERNEST LAPLACE said that, while always preferring to be conservative, it is impossible to make any rule in the treatment of club-foot that will be applicable to all cases. Some cannot be corrected by mechanical treatment and manipulation, and in these it will become necessary to do an operation on the bones. The personal equation must necessarily enter into the decision in each case.

DR. J. P. MANN referred to a very stubborn case of double congenital equino-varus in a young woman, twenty-five years old, in which by means of subcutaneous section of the soft parts, leverage, and plaster-of-Paris dressings it was possible for the patient to walk flat upon the soles of her feet. The plaster casts made at different times in the progress of the case show the marked improvement that had been wrought. To effect such a result required, of course, much time and several operations, but the patient was willing to submit to the treatment.

While not contending that there are no cases requiring operation on bone, Dr. Mann stated that it has been his fortune in an experience of ten years not to have encountered any. He quoted from the published opinions of forty leading orthopedic and general surgeons, who declared themselves not in favor of the removal of bone to correct club-foot.

When apparatus is required, the simpler in construction the better, as many of the cases are among the poor and unintelligent, and the use of a complicated apparatus may invite relapse.

In case of simple equinus the first and only structure to divide is the tendo Achillis, after mechanical measures have failed; but if the deformity is compound such division should be reserved to the last, as the tendon must be depended upon to afford a point of resistance in the various manipulations made in correcting the tarsal deformity. After the deformity has been entirely overcome the tendon may be divided. The tendo Achillis also, before it is severed, exercises the function of protecting the ankle-joint during tarsal correction.

After a certain age the tarsal bones become deformed, and it is realized that they are not made normal by pressure and tenotomy; but they are so molded as to permit the foot to assume its proper position.

Dr. Mann believed in persisting in mechanical treatment from birth to the time when the child begins to walk, feeling that the worst deformities do not yield as good results if operated on before this period as if operated on afterward. Perhaps 90 per cent. of the 500 cases treated by Dr. Mann occurred in poor patients and those living out of the city; yet it was not necessary to keep them in the hospital more than two months. Relapses were few, and these were due to neglect.

Dr. Mann in a long experience has seen no bad effects from the use of plaster-of-Paris dressings. Of course, these are to be applied by a competent individual, and students must be carefully instructed in the mode of application. No particular rule can be laid down for the treatment of any case. Some cases are cured by mechanical treatment, without operation. Others may require operative interference.

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## ANNUAL ADDRESS OF THE PRESIDENT.

JAMES C. WILSON, M.D.

[Read January 27, 1897.]

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In pursuance of a time-honored custom, I submit to you at the close of the year a brief review of the work of your Society.

The four regular quarterly meetings were well attended, and important business was transacted at each of them. The number of scientific meetings was twenty-one. The average attendance upon these meetings was forty-four; the

maximum attendance was sixty-eight. The number of new members elected during the year was thirty-seven; the number of the newly-elected members who qualified during the year was twenty-four. The discrepancy in these figures is due to the fact that most of those who have not qualified were elected at the last regular business meeting.

The number of papers and other scien-

tific communications made during the year was fifty-nine. A critical review of these communications reveals the fact that none of them was without practical and scientific interest and that the greater number are of high scientific value. It may be truly said that no meeting has been without important and instructive papers, and suggestive and valuable discussions. No member of this Society who has regularly attended its sessions fails to realize that his evenings have been profitably spent. The Society has kept itself in touch with the advance in medical knowledge; the latest results of the advancing labors of the profession have been presented to you in this hall and discussed in a spirit of broad and liberal criticism. In addition to the work done by the members of the Society, scientific men not members, distinguished for their achievements in fields touching upon medicine, have deemed themselves honored by the invitation to lay the result of their investigations before you, and have contributed greatly to the success of our meetings. As an evidence of the increasing interest of the members of the Society in scientific work, I may repeat the statement of the chairman of the board of directors that whereas two years ago there was some difficulty in securing a sufficient number of communications for some of the meetings, at the present time there is difficulty in securing opportunity for the papers that are offered.

The Society continues to make its power and influence felt in the meetings of the State and National Societies by the character of its delegates and their intelligent action upon questions relating to the welfare of the medical profession and the extension of its usefulness.

Among the important special committees appointed during the year was that charged with the duty of urging the American Medical Association to meet in Philadelphia in the current year—its fiftieth anniversary—a most important matter, since Philadelphia was the birthplace of the American Medical Association and Dr. Nathaniel Chapman, of Philadelphia, its first president. It is a matter of congratu-

lation to the members of this Society that the work of that committee was attended with an immediate general response on the part of the members of the American Medical Association, and that the meeting of that body will be held here early in June next.

A year ago it was my painful duty to allude to the fact that the Society was largely in debt and at that time had to face the necessity of abandoning the publication of the *Transactions* for the succeeding year. It is a gratification to state now that the treasurer reports to me that the Society has paid off during the year more than thirteen hundred dollars of old indebtedness and now carries no debt except that to the State Society for the year 1896—an obligation that there is every expectation of meeting at an early date from the current resources of the Society; and to add that an arrangement was entered into with the editor of the *MEDICAL AND SURGICAL REPORTER*, through which the proceedings of the meetings of the Society have been published from week to week in the columns of that journal, while at the end of the year the Society will receive 750 reprints of 251 pages at an outlay of \$163.15. Simply bound, with a proper index, etc., these sheets will make a creditable volume, representing essentially the scientific activity of the Society for the year. The editor of the *Transactions* adds a word in praise of the spirit in which the editor of the *MEDICAL AND SURGICAL REPORTER* undertook and has carried out his part in the publication of the proceedings of the Society, and further congratulates the Society on preserving the continuity of its annual volume of *Transactions*.

In congratulating the Society upon the successful outcome of the devoted labors of its directors and publication committee I desire to express my warm thanks, in which I am sure every member of the Society will concur, to the gentlemen comprising these active, energetic and faithful representative bodies of our membership.

A year ago I called the attention of the Society to the fact that the date of the last edition of the constitution and by-laws is 1887, and pointed out that a

new edition, embodying the changes to date, is greatly needed. The matter of the revision of the by-laws has been for some time in the hands of a committee that has not yet reported. I trust that ere another year has passed the members of this committee will have completed their work.

Some time ago the subject of changing the hour of meeting from 8 o'clock to 8.30 P. M. was agitated. In my former address I expressed the opinion that such a change should not be made without further careful consideration. The greater number of the meetings are largely attended, and the majority of the members, as a rule, enter the hall within a few minutes of the hour named for the opening of the Society. Notwithstanding this, many of our meetings have been late in adjournment, often far past 10 o'clock. It seems to me, therefore, that 8 o'clock—an hour long established by custom—should be retained. In this connection I again venture to suggest some further conciseness in the presentation of papers and in the discussions.

During the year eight members of the Society have resigned. Several of these resignations have been necessitated by a change of residence, and in particular has this been the case in two or three of the more active and interested of the number.

It is my painful duty to speak of those whose names are, for another cause, no longer upon the roll of active member-

ship. They have gone before us. New members join as the old depart, but the strength and power and usefulness of the Society continue. "Let us work while it is yet day, for the night cometh wherein no man shall work."

We recall with sorrow the death during the year 1896 of Arthur J. Hamilton, A. S. Roberts, James Graham, William H. Pancoast.

In retiring from the office of President, I desire to express to you my high appreciation of the honor which you have conferred upon me and to thank you for it. I shall cherish the memory of the hours spent in this Chair as among the most satisfactory and pleasant in my professional life. They have brought me into closer touch with the members of my beloved profession—with you. They have enabled me to know you, old friends, in a new and closer way. They have brought home to me the energy, studiousness, devotedness of the members of our guild—its high sense of duty, its lofty citizenship. I thank you again for permitting me, during these two pleasant years, to thus enter into nearer personal relationship with you. I thank you for your constant courtesy and your generous forbearance with my shortcomings as a presiding officer.

I congratulate you that you have chosen as your next President a member so distinguished as teacher, author, practitioner; but above all as a sincere, earnest, true man.

A BRIEF REPORT OF THE RESULTS OF A BACTERIOLOGIC INVESTIGATION OF THE NASAL MUCUS IN ONE HUNDRED CASES OF CHRONIC NASAL DISCHARGE, WITH SPECIAL REFERENCE TO THE PRESENCE OF THE KLEBS-LÖEFFLER BACILLUS.

EUGENE LARUE VANSANT, M.D.

[Read January 27, 1897.]

Although a full report of the following investigations will be published later, it may perhaps be of interest to those present to hear a brief statement of the results obtained. The patients included in the investigation all had one thing in common, namely, a chronic nasal catarrh; none of them was subject to any acute febrile affection, but all were simply the walking cases that I see daily in my office and at my service in the Polyclinic and Howard Hospitals. Great care was exercised in their examination to exclude all that showed any of the well-known clinical signs of diphtheria. The bacteriologic examinations were made by Dr. W. J. Gillespie, and, in the more important cases, were afterward reviewed by myself. The examination embraced 113 cultures of specimens taken from 100 different patients. Of these patients, twenty-five suffered with chronic atrophic rhinitis; thirty-one, with chronic hypertrophic rhinitis; fourteen, with chronic rhinitis; sixteen, with chronic purulent rhinitis; seven, with nasal syphilis; two, with disease of the accessory sinuses; four, with acute rhinitis; one with fibrinous rhinitis.

The bacteriologic examination shows the presence of diphtheria-bacilli in no less than thirty of the cultures examined, these cultures representing the discharges found in twenty-six different patients. In four additional cultures (obtained from three patients), organisms closely resembling diphtheria-bacilli were present. In fifty-eight cultures, staphylococci were found. Of these seven were recognized as staphylococcus aureus; five as staphylococcus

albus; one as staphylococcus citreus. The great majority of the cultures contained many diverse forms of organisms, such as bacilli, cocci, diplococci, etc. Leptothrix was found in four, bacillus subtilis in six, and yeast-cells in two of the cultures.

Of the twenty-six patients with diphtheria-bacilli in their nasal secretions, eleven were cases of chronic atrophic rhinitis; three were cases of chronic purulent rhinitis; five were cases of chronic rhinitis; three were cases of nasal syphilis; one was a case of acute rhinitis; and three were cases of hypertrophic rhinitis.

For each disease examined, the number of cases with diphtheria-bacilli was as follows:

Eleven of twenty-five cases of atrophic rhinitis; three of sixteen cases of chronic purulent rhinitis; five of fourteen cases of rhinitis; three of seven cases of nasal syphilis; one of four cases of acute rhinitis; three of thirty-one cases of hypertrophic rhinitis; none in two cases of disease of the accessory sinuses; none in the one case of fibrinous rhinitis.

The following clinical histories were obtained in some of the cases in which diphtheria-bacilli were present:

John McM., aged sixteen, a store-boy, consulted me in November, 1896, complaining of nasal obstruction and mucopurulent catarrh, with post-nasal dropping. He stated that the catarrhal symptoms had existed for about six months; but, although his general health had been below the usual standard, at no time had there been fever or symp-

toms of any acute disease. Upon examination of the nose, it was seen that the cartilaginous septum was deflected to the right, producing stenosis, with marked obstruction; while on the left side, the lower turbinal was hypertrophied. Both nasal chambers contained considerable muco-purulent secretion. There was also a chronic granular pharyngitis and some slight enlargement of the tonsils. Cultures were made from the nasal secretion, and the bacteriologic report was that it was almost a pure culture of diphtheria-bacilli. Upon investigation it was found that a younger sister of the patient had had diphtheria four months previously, and, furthermore, that different members of the family (which comprised ten children whose ages ranged from a few months to nineteen years) had all suffered more or less from nasal catarrh and sore throat during the summer and autumn. This information led me to decide to make further examinations. Six members of the family were examined and cultures were taken from their nasal chambers, with the following results: One, a school-girl of eight, was found to have chronic purulent rhinitis, with muco-purulent secretion. Bacteriologic examination showed "a few diphtheria-bacilli in involution-forms." Another, a girl aged nine, was found to have chronic purulent rhinitis, with muco-purulent nasal secretion. Bacteriologic examination showed "staphylococci, numerous leptothrix threads, and numerous small bacilli." Another, aged eleven, also a school-girl, was found to have chronic purulent rhinitis, with beginning atrophy and muco-purulent nasal secretion. The bacteriologic report was: "Staphylococci and long, slender bacilli." A fourth member of the family, aged six, a school-boy, had purulent rhinitis, with beginning atrophy and muco-purulent nasal secretion; also subacute follicular tonsillitis. The bacteriologic report was: "Large heavily-stained bacilli resembling diphtheria-bacilli in form." The mother, aged forty, showed fibrinous rhinitis, with a thick, white membrane clinging to both sides of the septum, with muco-purulent nasal secretion; the mucous membrane

of the pharynx was reddened and congested, but free from pseudo-membrane. The bacteriologic report stated: "Staphylococci and small irregularly stained bacilli." The mother related that all of the children had been in good health previous to last July, but that since then they had been continually suffering from a catarrhal condition of the nose and throat. All of the children examined were weakly, listless and anemic, but at no time, during the past six months, had any of them suffered from an acute illness.

Lizzie C., aged thirty-eight, a mill-worker, sought relief for chronic nasal catarrh, complaining of the formation of crusts, with thick muco-purulent nasal secretion, the duration of the symptoms extending back many years. Examination showed an advanced atrophic rhinitis. The lower turbinals had completely disappeared; the middle turbinals were enlarged, congested and polypoid. The pharynx was dry and glazed, and its mucous membrane atrophied, but no membranous deposit could be seen anywhere. The bacteriologic report was: "Typical culture of diphtheria-bacilli." Questioning and investigation failed to reveal the source of infection. The patient had no symptoms of any acute condition, and all the members of the family were well. This patient was kept under treatment for some months. Cultures were taken from the nasal mucus at different intervals, and with the exception of a time when certain local treatment was being applied, the diphtheria-bacilli persisted. Each bacteriologic examination gave the same positive results.

Mr. P., aged thirty-five, a grocer, consulted me six years ago, suffering from constitutional and nasal syphilis. The lower and middle right turbinal bones had been exfoliated. The left nostril was normal. The patient's health at the time was very poor, and he had lost forty pounds in weight. Appropriate treatment, however, soon restored him to his normal weight, his general health improved, and he discontinued his visits, except at long intervals. Last September, he returned, complaining of poor health, with pain in the region of the

frontal and ethmoid sinuses, and reported a loss of fifteen pounds in weight. Examination showed the right nasal chamber filled with crusts and mucopurulent secretion. The lower and middle turbinal bones, as before stated, had been exfoliated. The chamber was very large and some uncovered bone could be detected in the region of the ethmoid cells. Cultures were taken from the nasal chambers, and the bacteriologic report was: "A typical culture of diphtheria-bacilli." Inquiry revealed no source of the diphtheric infection. The patient was placed on active anti-syphilitic treatment and again rapidly regained health. Cultures were made from time to time from the nasal mucus and diphtheria-bacilli repeatedly found.

Many of the other patients with diphtheria-bacilli in their nasal secretions gave histories somewhat similar to those just cited.

#### REMARKS.

It is not my intention to discuss in this paper the specific virulence or non-virulence of the diphtheria-bacilli found in such a large number of these cases. Some experiments with cultures from several of the patients are about to be made upon animals, and may perhaps throw some light upon this point.

A number of interesting thoughts, however, arise upon contemplating the results already obtained by this investigation, and some of these may be said to be positively demonstrated. Thus, it would seem proved that in a large percentage of cases of chronic nasal catarrh, the secretions are infected with diphtheria-bacilli, staphylococci and other bacteria.

The importance of this fact in surgical procedures upon the nose, throat and adjacent parts, particularly the eye, is evident. Certainly the surgeon should precede such operations by a clinical and bacteriologic examination of the nasal chambers, and when necessary, institute treatment to remove the nasal infection. Such treatment should include very strict disinfection of the nasal chambers, and I would state that in most cases I had no difficulty in quickly effecting this purpose, although

for a permanent removal of the germs, treatment must be continued for some time, as in a number of cases, after stopping the local treatment, the diphtheria-bacilli were found to return and were recognized in the cultures. The diphtheria-bacilli were chiefly found in cases of atrophic rhinitis, chronic purulent rhinitis and nasal syphilis—in other words, where a pathologic condition of the nasal chambers, with altered and morbid mucous secretions, continues for a considerable length of time, thus offering a suitable soil for infection, not only by the diphtheria-bacilli, but by many other germs, as ascertained by the bacteriologic investigation. Now, it is well known that in such cases we frequently find several members of the same family affected with the same disease, and although certain inherited and acquired constitutional dyscrasias often underlie such conditions, yet we are impressed with the great importance, not only of disinfection, but also of avoidance of infection to others. From this point of view, the common use of a handkerchief among the children of a family, such infected children sleeping with healthy ones, or the indiscriminate kissing of children may be mentioned only to be unreservedly condemned.

In all the cases in which the diphtheria-bacilli were present, the patients were observed to be in ill health, being listless, pale and anemic. It was also observed that, after treatment was instituted, not only the local condition, but also the general health greatly improved. It may, therefore, be possible that in such cases there is a slight chronic toxemia caused by the nasal condition. Further, it is quite probable that such diphtheria-infected nasal secretions may account in part for the present wide spread of diphtheria—indeed, several instructive instances have come under my notice. It is to be hoped, therefore, that the proposed investigation upon animals to determine the virulence of the bacilli will aid in forming some positive decision. In conclusion, it gives me great pleasure to acknowledge my indebtedness to Dr. W. J. Gillespie, whose careful and painstaking laboratory work alone enabled me to collect the material for this report.

## DISCUSSION.

DR. A. C. ABBOTT said that the paper of Dr. Vansant is one of several showing that the diphtheria-bacillus, like other pathogenic bacteria, is liable to fluctuations in the degree of its disease-producing power. In earlier days the diagnosis was made, not alone by the microscopic detection of organisms having a definite shape and appearance, but it was requisite also that the organisms found should be cultivated, and inoculated into animals; and a diagnosis of diphtheria was made only when the inoculation proved fatal to the guinea-pig. Of course the time necessary to carry out this method in detail rendered impracticable its employment on a large scale. Experience has shown that it is not necessary to employ all the culture and animal tests, but in cases in which the clinical diagnosis justifies the suspicion of diphtheria, the finding of diphtheria-bacilli by microscopic methods alone is regarded as justifying the diagnosis of diphtheria. In the course of this work, it was found that from time to time cases arose that were clinically not diphtheria; such, for instance, as those referred to by Dr. Vansant. In 1890 or 1891, Dr. Abbott reported the results of examinations of a group of cases of ordinary sore throat, such as one sees in every dispensary, in three of which he found organisms that were not distinguishable by their microscopic appearance or by their cultural peculiarities from the typical diphtheria-bacillus, but they were without virulence, and when introduced into animals did not produce the disease. Such evidence simply teaches that the diphtheria-organism must be regarded as are all pathogenic forms; viz., as liable to fluctuations in virulence. Papers of the kind that Dr. Vansant has just read in no way weaken the proof of the causal relation of the bacillus diphtheriæ to true diphtheria. They simply illustrate that diphtheria-bacilli of low virulence may cause conditions other than that of true diphtheria as usually seen. The condition of membranous rhinitis is undoubtedly a modified diphtheria. In most cases, it causes no constitutional manifestations. In a certain number of instances, on the other hand, it is capable of giving rise to actual diphtheria in individuals with whom the patient comes in intimate contact. It is also capable of transmitting this peculiar, modified diphtheria, rhinitis. In these cases, practically without exception, the diphtheria-bacillus can be found.

DR. M. V. BALL considered it unfortunate that the observations recorded were not supplemented by animal experiments. Recent workers studying the pseudo-diphtheria bacilli, especially in England, have found that it is very difficult to distinguish the various forms of diphtheria-bacilli in regard to their pathogenic properties, unless inoculated into ani-

mals; that in both form and culture-appearances they are indistinguishable and, therefore, it may be possible that many of the bacteria or bacilli that Dr. Vansant calls diphtheria-bacilli are really not such.

DR. A. C. ABBOTT said, *apropos* of Dr. Ball's remarks concerning these so-called pseudo-diphtheria bacilli: For some time there was a warm controversy over the significance of those organisms which are morphologically and biologically identical with the true diphtheria-bacillus, but which differ from it in being more virulent. By some they were regarded as a distinct species, by others as modified diphtheria-bacilli. The latter view is now held by most of those who have had much practical experience in the work. It was held by Loeffler and others that the differential test is the ability of the one, designated as the true diphtheria-bacillus, to kill guinea-pigs, with definite pathologic lesions, and the inability of the other, called by them the pseudo-diphtheria bacillus, to kill the animal, although they may have been identical morphologically and biologically. On several occasions, Dr. Abbott has encountered the organisms that have been referred to as pseudo-diphtheria bacilli. While they do not kill animals, they have nevertheless the power to cause a local lesion at the site of inoculation that is histologically indistinguishable, save in degree, from that induced by the fully virulent diphtheria-bacilli. There seems no reason for regarding them as a separate species; it is much more natural to consider them as slightly virulent or non-virulent diphtheria-bacilli.

Dr. Abbott has always opposed the idea that the so-called pseudo-diphtheria bacillus and the true diphtheria-bacillus are distinct organisms. That they differ merely in degree is the opinion held by the majority of bacteriologists of to-day.

The term "pseudo-diphtheria" bacillus should be reserved for organisms in some respects like the diphtheria-bacillus, but still readily distinguishable from it by culture-tests, aside from the question of pathogenesis.

DR. FRANK WOODBURY said that he was so fortunate as to have had an opportunity, with Dr. Vansant, of studying clinically some of the reported cases, and he was struck by the fact of the entire absence of the ordinary symptoms of diphtheric poisoning and by the presence of evidences of impaired health of a different character from those ordinarily recognized as belonging to the disease diphtheria. It seems therefore that Dr. Vansant has unveiled the true cause of a new disease—one that has been hitherto overlooked—a sort of chronic diphtheria. His results are of great importance from the standpoint of the general practitioner, because, should a case such as he has reported

have an attack of ordinary tonsillitis or of catarrhal pharyngitis and cultures be taken from the nasal passages or the throat, there would be secured the evidence bacteriologically of the existence of diphtheria and the positive diagnosis might be made on that point, although it is true that authorities warn against the error of making the diagnosis strictly from the bacteriologic investigation. It may be mentioned that McFarland, in his recent work on *Bacteriology*, directs attention to this fact, that the diagnosis of diphtheria must not be based solely on the bacteriologic test, apart from the usual clinical manifestations of the disease. It has been known for a long time that disorders of the air-passages, malformations and abnormalities of different kinds, chronic inflammations, etc., have been accompanied by impairment of the general health. The researches that Dr. Vansant has made may possibly throw some light on the real nature of some of these and show that they are really toxemias or toxinemias and that the treatment should not be simply surgical, but should be bacteriologic and antiseptic, and under such treatment the general health will improve, even though the physical conditions in the nose may not be altered by removing the obstructions referred to. There is no distinction between pseudo-diphtheria bacilli and true diphtheria-bacilli, because it is entirely in the line of Pasteur's researches upon the virulence of bacteria that this is an incidental and not an essential quality of bacteria, that the pathogenic properties may be increased or diminished, or may be entirely lost, and the bacteria remain the same, and then, under other circumstances, by reversing the process, the virulent property may be regained.

At present, information is wanting on the conditions that the diphtheria-bacilli require, in order to develop the extreme virulence manifested in some cases that come under notice, so that death may be determined in a few hours, while in other cases, as Dr. Vansant has shown, the same bacilli may remain in the air-passages for months and cause only slight impairment of health.

DR. S. SOLIS-COHEN said that he had not intended to say anything, but Dr. Woodbury speaks of "chronic diphtheria" as being a new discovery of Dr. Vansant's. Dr. Vansant's paper is too good to be overweighted with false praise. It teaches much, but not this particular fact. Sir Morell Mackenzie called attention to the existence of chronic diphtheria twenty years or more ago. Dr. Cohen spoke with some feeling on this subject because a few years ago, with Dr. Eshner, he published a little work in which he called attention to this fact,\* and the work was, in the common phrase, "jumped on" by a certain reviewer for "the superstition of chronic diphtheria." One point this paper serves to

show is that a keen clinical observer often runs ahead of the bacteriologist and that the results of bacteriology usually confirm good clinical observations.

There is, however, another point of very great interest here. The question is: Does the development of diphtheria in a certain patient depend entirely upon the bacillus? Does it depend upon what has been termed the grade of virulence of bacilli, or has not the personal reaction of the patient very much to do with it? Dr. Cohen believed that he had competent support in the belief that personal reaction—the reaction of the body against the invading germs—has much to do with the results of inoculation. It is true that certain bacilli, when injected in any animal of a given species, will produce the same results, but in many of these so-called grades a culture will produce lesions quite grave when injected in one animal, and the same culture injected in another animal will produce little or no effect. Now, it is quite possible that the varying degrees of virulence are due to the personal reaction of the affected individual; that the bacilli, in other words, are modified favorably or otherwise by the culture-medium; and that notwithstanding their presence in a certain individual, he cannot be said to have or ever to have had diphtheria. Varying degrees of personal resistance exist; in other words, differences in the constitutions of patients—an old-fashioned idea, but one which even the progress of bacteriology will not set aside.

DR. FRANK WOODBURY added that he had not intended to confine his observations to the impairment of health due entirely to the diphtheria-bacillus, but to the presence in the nasal chambers of all or any micro-organisms, including the entire group that may cause chronic septic infection. This process is not necessarily specific, certainly not necessarily chronic diphtheria, but the toxemia might be mixed or it might be non-diphtheric, and yet the patient may have ill health clearly attributable to the development of micro-organisms and their products. Dr. Woodbury cited the case of a patient in whom only the bacillus subtilis was found, and no bacillus diphtheriæ at all, yet the patient had impaired health, and her health was much improved mainly by antiseptic treatment of the nasal passages.

DR. E. I. VANSANT agreed with the view in regard to the various gradations of virulence of diphtheria-bacilli. At the same time it seems to be proved that a large percentage (26 per cent.) of the cases examined had diphtheria-bacilli in their nasal secretions, and, furthermore, that these bacilli were true diphtheria-bacilli. The bacteriologic examinations were made with the greatest care by Dr. Gillespie, an experienced bacteriologist. The cultures in many instances were tested many times. Such results, therefore, must be taken

\* *Essentials of Diagnosis*, p. 78. Phila.: W. B. Saunders, 1892.



into consideration in the diagnosis in any case in which diphtheria is possible. The suggestion that the germs present lead to more or less ill health by causing a chronic toxemia throws still further light on the subject, and is of great interest when one considers the large number of cases that come under observation with what are called catarrhal conditions of the nose and throat. In these cases a history something like this is frequently obtained: A child, previously in good health, following some acute disease, such as measles, whooping-cough, scarlet fever, etc., has a chronic catarrhal condition of the nose and throat. There has undoubtedly taken place a chronic sub-acute inflammatory condition of the upper air-passages, with altered secretions, which soon become

infected. The noxious matters are then absorbed by the lymphatics and very shortly cause enlargement of the glandular tissues of the pharynx. Soon adenoids, enlarged tonsils, enlarged glands appear at the angle of the jaw, etc. Some of these cause obstruction to normal respiration and this adds to the ill health present. In some cases such catarrhal conditions are preceded by an inherited or acquired predisposition, *e. g.*, to gout or syphilis, which increases the liability of the individual to such affections. A point that could probably have been dwelt upon more extensively in the discussion is that of possible contagion in cases of atrophic rhinitis and purulent rhinitis. It is a common experience to find chronic purulent rhinitis or atrophic rhinitis present in several members of a family.

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## THE "SCHOTT METHOD" OF GYMNASTICS IN THE TREATMENT OF CHRONIC DISEASE OF THE HEART, WITH REPORT OF A CASE, AND DEMONSTRATION OF THE EXERCISES.

SOLOMON SOLIS-COHEN, M.D.

Assisted by

CHARLOTTE WEST, M.D.

[Read January 27, 1897.]

The treatment to which I desire to call the attention of the Society is a portion of the so-called Nauheim treatment of cardiac disease, which was inaugurated some twenty years ago by Drs. August and Theodor Schott, and has recently found its way into English literature. Dr. August Schott, now deceased, published his first paper in the *Berliner klinische Wochenschrift*, in 1880. Dr. Theodor Schott published his first paper in the same journal in 1883. Since that time both the brothers Schott have published several monographs and journal articles on various phases of the subject, and in 1891, at the instance of Dr. W. Bezley Thorne, Dr. Theodor Schott communicated to the *Lancet* a brief account of his methods. Dr. Thorne published a monograph on the subject in 1895, and for the last two years, proba-

bly because of the great success that Dr. Thorne has been having in London, in the treatment of chronic diseases of the heart by the Nauheim methods; the *British Medical Journal* has been pretty well filled with papers upon this theme. Several eminent British physicians, among them Sir William Broadbent and Sir T. Grainger Stewart, have visited Bad Nauheim and recorded their observations, all very much in favor of the method and confirming the scientific character of the observations of the brothers Schott. In fact, a very noticeable feature of these reports is the praise accorded to the Drs. Schott for their moderation in statement and their carefulness in observation; particularly when we consider the really wonderful nature of the recoveries that they report. The description here given of the ex-

ercises and their effects are cited from or largely based upon the writings of the British observers mentioned.

The treatment carried out at Nauheim is directed toward the relief of the damaged heart, in cases of dilatation or of ruptured compensation associated with valvular lesions, by action upon the peripheral vessels and blood spaces; partly through the effect of thermal, saline and carbonated baths, and partly by a special system of gentle muscular exercises, which, with the assistance of Dr. West, I shall partially demonstrate this evening. The baths are an important but not an essential portion of the treatment—that is to say, the exercises will do a great deal alone, as we have experienced in four cases. In some instances the baths alone are said to have been successful. At Nauheim, the baths are given in gradually increasing strength in the natural waters, which are of various temperatures and carbonated, containing likewise a number of alkaline and iron salts. Dr. Schott and Dr. Thorne both say, however, that the essentials of the baths can be artificially reproduced by the use of heat and the appropriate reagents, and give formulas for the purpose, chiefly calling for the use of sodium and calcium chlorids, and finally the addition of free carbon dioxid; the latter being released from reservoirs, or evolved in the bath by the use of sodium bicarbonate and hydrochloric acid. I hope soon to have facilities for observation with these artificial baths, but up to this time I have nothing special to report concerning them, and therefore shall confine my remarks this evening to the exercises.

I was under the impression—until I hunted up the literature—that my lecture and demonstration at the Philadelphia Hospital in November last, late as it was, had been the first American contribution to the subject, but I find that Dr. Robert H. Babcock, of Chicago, published a communication in the *Journal of the American Medical Association* for 1893, Dr. Babcock himself having been a patient of Dr. Schott's, and reporting his own case and some other cases on his return to

America. One feels somewhat chagrined at his own tardiness when he reads this communication and the others referred to.

The method of exercise is called by Dr. Schott *Widerstandsgymnastik*—resistance-gymnastics. Perhaps the best way to English this term would be to call it *resistance-exercises*, but this alone would not convey the idea. "Swedish movements" are resistance-exercises, too; but this system is differently carried out. "Gently-resisted movements" would perhaps convey the idea better. The patient makes very slight efforts with various muscles, and these are resisted very gently by the operator. As the treatment progresses the resistance is increased, calling upon the patient to put forth greater exertion. There is a course of exercises laid down by Dr. Schott, the whole occupying from thirty minutes to one hour, but the number and degree of movements are varied according to the patient's requirements. With my patients only twenty minutes' exercise has thus far been attempted.

Dr. Schott says that his system consists of slow movements made by the patient and resisted by the operator, short intervals being allowed for rest. The exertion should be small and the patient should be loosely clothed and told to breathe quietly. This matter of quiet breathing is quite important. It must be watched and controlled by the operator. The resistance should not be of such a kind as to prevent the patient feeling master of the situation. The operator must not grasp or in any wise constrict the limb, but oppose by the hand held flatly. The following rules are laid down:

1. Each movement is to be performed slowly and evenly, that is, at a uniform rate.

2. No movement is to be repeated twice in succession in the same limb or group of muscles.

3. Each single or combined movement is to be followed by an interval of rest.

4. The movements are not allowed to accelerate the patient's breathing, and the operator must watch the face for the slightest indications of (a) dilatation of

the *alae nasi*; (b) drawing of the corners of the mouth; (c) duskiuess or pallor of the cheeks and lips; (d) yawning, (e) sweating; and (f) palpitation.

5. The appearance of any of the foregoing signs should be the signal for immediately interrupting the movements in process of execution, and for either supporting the limb which is being moved; or allowing it to subside into a state of rest.

6. The patient must be directed to breathe regularly and uninterruptedly, and should he find any difficulty in doing so, or for some reason show a tendency to hold his breath, he must be instructed to continue counting in a whisper during the progress of each movement.

7. No limb or portion of the body of the patient is to be so constricted as to check the flow of blood.

The physiologic effect and therapeutic object of these procedures are to accelerate the flow of blood through the vessels, and diminish the work thrown upon the heart, allowing its chambers to contract more readily—hence the importance of attending strictly to the details mentioned.

The exercises consist in motions with the limbs, hands, feet and trunk, made against slight resistance. They are so devised as to call into operation, according to a definite order and succession, nearly every voluntary muscle and system of muscles in the body. While this order has been carefully worked out by the brothers Schott as the result of long experience, the physician is to use his judgment as to which exercises are to be used and which omitted in any particular case. The system advised begins with the upper extremities, goes to the trunk, then to the lower extremities and concludes with a return to the upper extremities. The motions include extension, flexion and rotation or circumduction. As already stated, the movements are carried out in a certain definite system, uniformly, with intervals of rest after each movement, and with gentle resistance upon the part of the operator, who carefully watches the effect, so that the patient shall not be exhausted. The operator especially regulates the patient's breathing (which is not allowed to be-

come accelerated) and watches the color of the face; hurried breathing, even distention of the nostrils, flushing, pallor, or sweating being a signal for interruption or cessation. In suspending the treatment, the operator's judgment decides whether to support the part being exercised in the position it has assumed, or to allow it to return gently to a position of normal rest. So, too, while it is best for the patient to stand, he may sit or lie when too feeble to begin treatment, otherwise.

The following is the list of exercises:

1. Arms extended in front of body on a level with shoulder, hands meeting; arms carried out until in line and brought back to original position.

2. Arms hanging at sides, palms forward; arm flexed at elbow until tips of fingers touch shoulder, back to original position; one arm only moved at a time.

3. Arms down, palms forward, arms carried outward and upward until thumbs meet overhead; back to original position.

4. Hands in front of abdomen, fingers flexed so that second phalanges touch those of opposite hand; arms raised until hands rest on top of head; back to original position.

5. Arms down, palms against thighs, arms raised in parallel planes as high as possible; back to original position.

6. Trunk flexed on hips; return to original position.

7. Trunk rotated to left—to right; return to original position.

8. Trunk flexed laterally.

9. As No. 1, but fists clinched.

10. As No. 2, but fists clinched.

11. Arms down, palms against thighs, each in turn raised forward and upward until arm is alongside of ear, then turned outward; arm descends backward.

12. Arms down, palms to thighs, both together moved backward in parallel planes as far as possible without bending the trunk forward.

13. Thighs in turn flexed on trunk, opposite hand resting on chair.

14. Lower extremities in turn extended fully, and bent on trunk forward and backward to extreme limits of movements, opposite hand resting on chair.

15. Legs in turn flexed on thighs, both hands on chair.

16. Feet together, lower extremities in turn abducted so far as possible and brought back to original position, opposite hand on chair.

17. The arms, extended horizontally outward, are rotated from the shoulder-joint to the extreme limits forward and backward.

18. The hands in turn are extended and flexed on the forearm to extreme limits and brought back in line with arm.

19. The feet in turn are flexed and extended to extreme limits and then brought back to their natural position.

The duration of the exercises is from twenty minutes to an hour and a half, an hour being the average at Nauheim, even in the beginning. The following are the results stated to be obtained by the baths and exercises at Nauheim:

(1) Diminution in the frequency of the pulse, with increase in its force and fullness; (2) Contraction of the heart, as shown by diminution in the area of cardiac dulness and recession of the apex-beat upward and toward the median line. (3) Slower and deeper breathing, with a senseness of lightness and relief in the chest; (4) A better color of the lips, and improved facial aspect; and, (5) When that organ has been congested, a marked diminution in the size of the liver. Furthermore, after a few days of systematic administration of the exercises, there is usually observed marked, and often long-maintained, diuresis. Pathologic effusions are often completely removed.

Dr. W. Bezley Thorne says: "The results, in fact, are such as would scarcely be believed by any one but an eye-witness. It is by no means uncommon in cases of dilatation to see within one hour the oblique long diameter of the heart's area of dulness diminish by from three-quarters of an inch to an inch and a quarter, and, perhaps, more surprising still, to observe a diminution of as many as two inches, in vertical measurement, of a liver which at first extended to the umbilical level; and to hear the patient, at the conclusion of what cannot be described as an ordeal,

volunteer the statement that a load has been removed from the precordia, that he breathes easier and more deeply, and experiences a sense of general relief. Such gains are not permanent, and in the time that intervenes before the next day's exercises or baths, as the case may be, the dilated and congested organs tend to resume their former size, but do not wholly relapse. A slight proportion of the gain is held . . . . .

. . . . . until, as the result of treatment, perhaps at the end of a few weeks, the dilated heart and the congested liver have recovered their normal dimensions, or at any rate such contraction and compensatory power in the one case, and resolution in the other, as to make them practically sound."

Sir. T. Grainger Stewart concludes, as the result of personal observation with the Nauheim treatment:

"1. That in a large proportion of cases it effects immediate improvement in the condition of the heart, as shown by percussion and auscultation; the sounds becoming more distinct and the area of dulness diminishing to a greater or less extent.

"2. That in many cases the rhythm of the pulse improves, and the beat becomes more vigorous.

"3. That while the immediate effect is in so far temporary, the heart rarely goes back to its previous condition of dilatation, but remains somewhat smaller than it had been before the exercises, and that gradually improvement of a lasting kind sets in, so that the heart recovers its tone and the area of dulness permanently diminishes."

As to the effect in cases of valvular lesions, it is stated that in the course of the first few movements a bruit due to stenosis is observed to be accentuated, but afterwards diminishes, as the peripheral resistance lessens. In our case the accentuation of the bruit has remained, the sound at first having been but faintly heard, owing to the weakness of the cardiac muscle, and its greater audibility now being interpreted as a sign of increased muscular vigor. Indeed it is urged as a diagnostic merit of the method that valvular lesions previously unsuspected may become recog-

nizable by the development of murmurs during treatment. Murmurs due to insufficiency, other than that caused by actual lesion of the valves, are diminished in intensity, modified as to duplication and finally obliterated. In cases of early valvular lesions, the murmurs are said to disappear as the final result of treatment. The condition of the cardiac muscle has been so much improved in the very chronic cases that I have had under observation that we may readily believe the statement that in early cases all traces of myocarditis are removed.

The counter-indications against the treatment in the entire range of chronic cardio-vascular affections are advanced arterio-sclerosis, decided degeneration of the cardiac muscle and aneurism. Some of the conditions earlier deemed counter-indications are now not so considered. Thus, in the patient before you this evening, a quite advanced case of arterio-sclerosis, the exercises have certainly done much good. The only absolute counter-indications that remain generally insisted on are marked atheroma, as with pipe-stem arteries, and advanced cases of aneurism in which clots might be loosened and emboli thrown out into the circulation. One should, however, be cautious until he has had sufficient experience to decide for himself. It might be very rash for me to apply the method in a case Dr. Schott might so treat with benefit.

Dr. Thorne states that he has witnessed improvement amounting to practical or actual cure in cases presenting the physical signs usually regarded as indicative of the following affections; stenosis of either the aortic or the mitral orifice, stenosis of both, insufficiency of either or both, with attendant dilatation; dilatation consequent on myocarditis, on habitual hemorrhage and on constitutional anemia; fatty heart (interstitial); weakened heart; congenital mitral insufficiency; patent foramen ovale; and angina pectoris of apparently both neurotic and organic causation. He adds that "it is reasonable to assume that measures calculated to diminish peripheral resistance, and to promote the nutrition and repair of the cardio-vascular tissues, must be applicable to,

at least, the early stages of aneurism of the heart and great vessels."

The physiologic mechanism by which this is accomplished is in brief that the gently-resisted movements, carried out as described and demonstrated, dilate in turn the peripheral vessels in every section of the body, and distend the lymph-spaces, and thus by employing for therapeutic purposes the pumping action of the muscles and relieving the veins, securing increased filling of the arteries and better emptying of the heart. In other words, by increasing the volume of circulation in both arteries and veins, by better filling of the vascular system generally, including lymph-channels and lymph-spaces, and thus affording a much larger peripheral area for the blood, the left heart is better emptied by invitation of the blood out of the capillaries, the arterioles, the larger arteries, the aorta; and back pressure upon the left auricle being relieved, the right heart is relieved through the pulmonary circulation, and thus the veins are still further emptied, the congested liver often markedly diminishing in size. In effect the peripheral pump is substituted for the central pump of the circulation, and the latter, being able to contract upon the lessened quantity of blood, now becomes able to do its work once more, and all this without the use of any drug. When necessary, of course, the exercises and baths may be aided by judicious medication.

I have here some careful notes of the case before us which have been made by Dr. West. It will not be necessary to read them in full. The patient, a widow, fifty-eight years old, came under observation at the Philadelphia Polyclinic on the second of October, 1896; having had influenza, of three weeks' duration, a year before, followed by dry pleurisy. For the past five years she has been subject to attacks of dyspepsia and nervousness. A good deal of mental disturbance had recently made her more nervous. In addition to the dyspeptic symptoms, she sought relief for dyspnea, constant, and increased on exertion, headache, vertigo and continuous palpitation of the heart, which gave rise to a sound heard in the left ear. There is

also at times a sensation of "stoppage" of the heart—what my friend and colleague, Dr. Riesman, has termed "paulocardia." While in high altitudes (Colorado) she was subject to fainting spells. On examination the heart was found dilated and displaced to the left, the apex-beat being in the sixth interspace one inch to the left of the nipple. Both sounds were feeble, the second being relatively accentuated. There was a faint, harsh systolic murmur, heard best at the aortic cartilage and feebly transmitted into the neck. The pulse was small, feeble, its rate 96, with the patient standing, the artery somewhat hardened. There was occasional intermittence. Small quantities of albumin and granular and hyaline casts were found in the urine. There was no edema.

Under treatment the heart has receded, until the apex, from being one inch to the left of the nipple, is now permanently half an inch to the right of the nipple; and from the sixth interspace it has receded into the fifth. The sounds are stronger, the first markedly so, and the murmur is more distinct, though perhaps softened in quality. Intermittence has ceased. The artery is larger, the beat fuller and slower; the record of to-day being 68 with the patient seated. The sphygmographic tracings which I exhibit, and which were taken respectively before, immediately after and ten minutes after the exercises on a number of occasions, the pressure being but slightly varied, as recorded, and the instrument and the observer being the same in each instance, show the great improvement in the fulness of the arteries and in the character of the beat. For instance, at the beginning of treatment there was scarcely any elevation

of the lever and the tracing is markedly that of rigid, unfilled arteries—the tidal wave being wanting. This may be contrasted with the recent tracing in which the pulse is beginning to resemble a normal pulse, the elevation being, however, less than normal, and the tidal wave still obscured; for, of course we have not given the patient new arteries. The patient has lost her unpleasant symptoms, except that there is still a slight noise in the ear. In especial she has lost the extreme depression and dread of suffocation which were the most distressing features of the case.

The albumin has disappeared from the urine and I find that similar cases are also recorded by Dr. Schott and Dr. Thorne. In another Polyclinic case, one of mitral regurgitation and interstitial nephritis the albumin was markedly diminished but did not entirely disappear. However, the patient felt so much better, her edema having gone, and her dyspnea being relieved, that she declared she was well and went back to work. For this reason I have been unable to bring her before you this evening. In conclusion let me say that this is but a preliminary communication to call your attention to the subject; in the effort to atone as much as possible for my long neglect of the method, by doing my share to make its merits more widely known.

From reading and my limited observation, I believe the Nauheim system to be one of the greatest advances in the line of therapeutics without drugs that has yet been made; worthy to rank with Brand's cold-bath treatment of typhoid fever and the pneumatic treatment of pulmonary tuberculosis. It is more troublesome than the writing of prescriptions, but in suitable cases, much more effective.

## DISCUSSION.

DR. J. MADISON TAYLOR expressed interest in all forms of treatment that depend upon such simple measures as regulated exercises. Physicians have surely begun to appreciate the limitations of the effects that can be accomplished by treatment without drugs. Dr. Taylor has watched the Bad-Nauheim treat-

ment and has employed it with certain modifications with excellent success. The so-called Schott treatment has become popular in England through the industrious circulation of men like Bezley Thorne; but in Germany the originator of this method is well known to be Professor Beneke, whose two principal

assistants were Drs. Gröbel and Schott. The latter did not hold the same high official position with relation to the treatment as did Gröbel. The man at Bad-Nauheim to whom patients are most usually sent by Continental physicians is Medicinalrath Dr. Gröbel. It is a pity that this most admirable method of treatment, from which such excellent results could come (if only people had the patience to pursue it), should be named after any one man, unless he were the sole originator. Nevertheless, the brothers Schott have brought this treatment to a very high degree of perfection and they have given it an element of prominence, or as Americans would say, have given it a "boom," which has made it reach America by the way of England. If this system, composed of special baths and regulated exercises, were known, as it should be, as the Bad-Nauheim treatment resulting from the labors of the men named, and not merely that of the Schott brothers, the designation would be more accurate and the treatment would secure the standing that it deserves. There is no question, however, about its value, and the different gentlemen who practice it differ very little in their methods. The only difference between the Schott and the Gröbel exercises (and they are both precisely the same as the so-called Swedish or regulated movements) is that in the Schott treatment a good deal of emphasis is placed on treatment of the region of the heart. The manipulations are begun with superficial massage, involving chiefly the back and limbs; then the exercises are proceeded to by gradual degrees, the passive form of exercise being first pursued and then the more active forms, as rising steps that come up through all these regulated gradations of mechano-therapy. In Dr. Gröbel's method the patient is directed between exercises to take long, steady, deep inspirations, and also there are times when the patient is instructed to rest or sit down for a bit, according to the degree of fatigue-reaction he shows. There are various points that should be watched, the condition of the skin, slight tendency to sweat, etc.

As to the practicability of these and similar exercises, they certainly can be pursued even here and partially to great advantage if intelligently directed. One of the forms of disturbance hardly to be called a distinct disease not alluded to by Dr. Cohen, was the vaso-motor ataxias (his own term)—conditions in which vaso-motor disturbances manifest themselves in tachycardias or circulatory disturbances of various sorts, with oftentimes enlarged heart, etc.

The patient about whom Dr. Taylor knew most as having pursued this treatment thoroughly, had originally a very considerable tachycardia with enlarged heart, and is now practically well. He did all that he could for her, and others of the highest authority did the same, without conspicuous benefit. She

finally went to Europe, took the full Bad-Nauheim treatment and recovered.

Dr. Taylor frequently uses regulated exercises in the treatment of disordered hearts when greater quiet had been recommended, and finds the method amply justified. Especially is this true when certain hydropathic measures accompanied. The secret of success is understanding the capabilities and needs of the case and cautiously, but most systematically increasing activities—always intermitting these upon evidence of over-strain of any kind.

DR. JOHN H. MUSSER presented some diagrams of cases treated by the method described that he had had the opportunity of studying.

The first series included three diagrams from a case of dilatation of the heart at the Philadelphia Hospital. Dr. Musser has been able to satisfy himself of the correctness of the results pointed out by Dr. Cohen, namely, that after treatment there is a diminution in the area of cardiac dulness, that there is a change in the position of the apex-beat of the heart, and with this there is also marked diminution in the pulse-rate and, of course, secondarily relief from the cardiac symptoms. The treatment was begun on January 16th, and continued for twenty minutes. The patient presented all the subjective and marked objective symptoms of cardiac dilatation, and there was no change whatever in the area of dulness after the first treatment. In the succeeding treatments there was great diminution in the area of cardiac dulness. The last diagram shows the remarkable change that took place in the area of cardiac dulness, as compared with the first. In the first diagram the right border of cardiac dulness extended one-half inch to the right of the sternum; to-day the right border is at the middle line of the sternum, while the limit of the left border of cardiac dulness has fallen inward. The apex-beat, which had been in the sixth interspace in the nipple line, receded to the fifth interspace, and while at first at the nipple, fell half an inch within that point. The pulse-average was 90; it became 64. The same remarkable changes were observed in other cases. In a patient, in private practice, the apex-beat had fallen one and a half inches internal to what it was three weeks before, and the relief experienced is most remarkable. She now sleeps perfectly during the entire night; she is free from cardiac asthma or dyspnea—indeed, has no symptoms whatever referable to the heart. She had a pulse of 80 when the treatment was commenced, which became usually 60 or 65. Dr. Musser corroborated the change in the character of the pulse-tracings indicated by Dr. Cohen. The tracings show the same character of change in the pulse—the volume and strength are increased, the rhythm, in cases in which there had been irregularity, becoming normal. Dr. Musser ad-

mitted it as possible that good luck had attended the treatment in the five or six cases managed in this manner, but thus far he agreed with Dr. Cohen in lauding the method, which seems to be a very satisfactory therapeutic measure without the administration of drugs.

Dr. Musser is not satisfied, however, with the gymnastics alone, but proposes to use also the baths. As pointed out by Thorne, these can be improvised at home. It is probably better, however, that the patients should go to Nauheim, where they can have the benefit of the surroundings, which play an important part in the cure; but this is not absolutely necessary, and a bath of the same chemic composition can be prepared elsewhere.

DR. T. J. MAYS said that the puzzling part about this treatment is in regard to the claim that the area of cardiac dulness diminishes, and that peripheral blood-vessels dilate during and after each exercise. The possibility of the former is evident, but not through muscular exercise alone. In regard to the pulse-rate and the respiration-frequency: physiologists teach that the slightest exercise will increase the rate of the heart and also of the respiration. Now, here an increase of muscular exercise and of muscular action is attended with a reduction in pulse-rate and also in respiration-frequency. It can very well be understood how the pulse could come down in the course of a few weeks' or months' treatment, but that it should come down at once is inexplicable on the score of the knowledge we have of the physiology of muscular exercises pure and simple.

DR. JAS. TYSON said that he had two cases under treatment at the University Hospital by the imitated Nauheim baths only, in one case associated with massage, pursuing this part of the treatment as the easier and more feasible. One is a case of marked arteriosclerosis, the other a case of advanced mitral disease with dilatation of the heart and effusions into the abdominal cavity and one pleural sac. The improvement in the first case was gradual but positive. Here, as in some of the cases alluded to, a very pronounced albuminuria became gradually reduced, and the general improvement of the patient, with removal of the dropsy, better action of heart and lungs, was marked up to a certain point. The case has, however, come to a standstill, beyond which it seems impossible to carry the patient to anything like practical recovery.

In the other case, which is more serious, with abdominal and pleural effusions, after the first bath the apex of the heart rose from the sixth to the fifth interspace. This case has had only two baths and the treatment has not been continued long enough to produce any decided effect, excepting in so far as the apparent very remarkable reduction in the size of the heart observed after the first bath.

DR. S. SOLIS-COHEN said that the reason

he termed this paper "The 'Schott Method' of Gymnastics in the Treatment of Chronic Disease of the Heart" is because that is exactly what the communication is. The gymnastics *plus* the baths constitute the Nauheim treatment, but having had no experience with the baths, he had restricted his remarks to the exercises.

Now as to the name of Schott as applied to this method: In the first place, these are the exercises devised and carried out by the brothers Schott. Beneke wrote upon the value of the Nauheim waters in the treatment of gout, osteoarthritis, rheumatism and that class of disorders; and Groebel uses a kind of mechanical resistance in place of the intelligent operator of the Schott system. The exercises themselves vary also.

Dr. Cohen was gratified to hear of Dr. Taylor's experience in regard to vaso-motor ataxia, because he has been long searching for a good system of treatment for this group of affections. He had indeed instituted the treatment in some cases and he finds that Dr. Bezley Thorne, among others, reports great improvement in such affections.

Dr. Cohen purposed to use the baths at the Polyclinic Hospital on a private patient and he hoped to have some favorable experience to report later. He submitted additionally a tracing which showed the effect of a month's treatment upon a patient with advanced mitral regurgitation and interstitial nephritis who came under observation October 14, 1896. One would scarcely imagine from the tracing that the patient was the subject of serious heart-lesion.

As to the points raised by Dr. Mays, the fact of the subsidence of pulse and respiration is undoubted. In some of the records handed around, pulse, temperature, and respiration, before and after the exercises, are carefully tabulated. Thus the pulse in one case falls from 96 to 72, at another time from 84 to 68, and so on. The respirations do not increase because they are not allowed to. That is an essential part of the treatment; and that is why the results of this form of exercise differ from those of all other forms. As to the pulse, the explanation seems simple. Dr. Schott invoked a reflex influence on the pneumogastric, but that seems hardly necessary. The caliber of the arteries and the whole peripheral area of blood-distribution in the skin and muscles, including the lymph-spaces, is increased. Hence, a larger flow of blood passes in a given time, the heart contracts better, and the rate is lowered. Although the increased muscular area of blood-distribution is the most important factor, the fact is undoubted that the caliber of the arteries is increased. One's fingers will tell him that at the radial pulse and the sphygmograph will show it. Dr. John Broadbent and Sir William Broadbent have published a careful study in the *Practitioner*, and the explanation given of



the results of the exercises is taken from these papers and that of others cited. Sir Philip Smyly, for instance, says:

".....There will ever be a feeling against this treatment until it is clearly seen and believed to be true:

"1. That the movements relieve the back pressure on the heart.

"2. That the diminution in the size of the heart is due to the absence of excess of blood in its cavity.

"3. That this is attained by there being more room in the arteries.

"4. That the heart-muscle gains strength by having room to contract.

"5. ....That the contraction being more complete, it takes a longer time, thus making the pulse slower, and, at the same time, fuller.

"6. Being able to send on more blood, it is ready to receive more, and thus removes venous congestion.

"7. The strength gained by the heart is due to the freedom to contract fully."

Dr. Cohen has not yet felt justified in forming a theory from his own observation at

variance with that which has been formulated as the result of prolonged study by the men quoted, and, indeed, so far as his theoretic knowledge would carry him, it seems to be a perfectly simple thing. By gentle exercise, well distributed and not suffered to increase respiration—that is, by peripheral pumping—a load is taken off the heart, and the natural result of increased fulness of the pulse and diminished rate of the heart must go together. In the permanent result, increased nutrition plays no mean part.

DR. T. J. MAYs said that it is important to decide on a scientific basis the question as to whether the peripheral circulation dilates or not under this mode of treatment. Many of the sphygmograms with which Dr. Cohen illustrates his paper show a higher pulse tone or tension after than before the treatment, and if any deduction can be drawn from this, it certainly is that the peripheral circulation does not dilate, but that it contracts under such exercise. Hence, there must be other factors involved in the production of the good effects of this treatment than the supposed distention of the peripheral blood-vessels.

## A PORTABLE CYLINDER OF ACETYLENE GAS FOR SURGICAL ILLUMINATION.—A SELF-RETAINING DOUBLE-BLADED WIRE VAGINAL SPECULUM.

ANDREW J. DOWNES, A.M., M.D.

[Exhibited January 27, 1897.]

On numerous occasions a bright light is needed in medicine, both by the specialist and the general practitioner. A good portable illuminant is especially desired. Up to the present time there has been but one such light, the incandescent generated by a storage battery. I need not mention how unsatisfactory this is. It makes too heavy an outfit and is too expensive; when most needed the battery may not work and, besides, the light, with an unwieldy battery and a large film, is too weak. Having some acquaintance with the properties of acetylene gas I inquired of the Acetylene Gas Light Co. if it would not be possible for them to supply a small cylinder

capable of furnishing a light for some hours. I was surprised to find that they already had a number of cylinders, sixteen inches long by one and one-half inches in diameter, with a capacity for holding enough liquefied gas to supply a flame of sixty-candle-power for from eight to ten hours.

They were kind enough to loan me a cylinder, which I used in St. Mary's Hospital for furnishing the light in cystoscopic examination and ureteral catheterization—the first time, I believe, the light was used in medicine. Reflecting from this intense white light, I found I had a much better view of the bladder and succeeded more easily in finding

the ureteral orifice than when I had used the electric light.

The strength and intensity of this white light brought out, it seemed to me, with greater distinctness the vessels and other features of the bladder-wall. My object in introducing this light to the attention of the profession is that the Acetylene Light Co. may be induced to supply for the use of physicians a small portable cylinder, the most suitable measurements of which would be eight inches in length and three inches in diameter.

There is but one objection to the use of this light—that is, being an exposed flame, it should not be used in close proximity to ether. The danger of explosion of a cylinder of such small size as that indicated is practically *nil*. Such a cylinder would weigh between two and

three pounds. The light, of sixty-candle-power, is intensely white. With an apparatus so light in weight, so portable and so manageable as this the physician need never be unable to examine thoroughly at private residences any of the accessible cavities of the body.

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The wire speculum is made up of two blades, the wire forming which constitutes the spring to hold them apart, so that when in use the instrument is out of the way, pressed against the thighs. It is distinctly an operating speculum, and it is too strong for ordinary examinations. It holds itself in place well and keeps the anterior and posterior walls of the vagina quite apart. It affords a good view of the cervix and allows considerable traction on it.

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## THE SIGNS AND SYMPTOMS OF AORTIC ANEURISM.

FREDERICK A. PACKARD, M.D.

[Read February 10, 1897.]

The subject of the signs and symptoms of aortic aneurism has been quite thoroughly threshed out and there is nothing that I can say in this paper that will materially add to our knowledge of the subject. Inasmuch, however, as I have had the opportunity within recent times of seeing quite a number of cases of aortic aneurism, my own interest in the subject has been much stimulated. I have had reason, since more carefully looking up the subject, to regret my lack of knowledge of some of the signs less well known and less frequently mentioned, on account of the fact that, while I have carefully studied the cases for purposes of diagnosis, I have failed to investigate them in regard to the presence or absence of certain of these signs and symptoms whereby I might have

added some statistical data that could have been of value in determining their true significance. Of these signs I would mention Drummond's, Glasgow's, Cardarelli's, Perez's, and possibly Schnell's. It is on this account that I have attempted to present a collected view of the means at our command for arriving at a correct diagnosis in the more obscure cases.

Of aortic aneurism it may be said that in well-marked cases the diagnosis is extremely easy; in other cases it may only be made by careful consideration of signs and symptoms; in others its presence may be suspected but not be capable of definite proof; while in others it may be entirely unsuspected.

The signs and symptoms are but poorly adapted to classification, inas-

much as they vary so much in accordance with the seat and relations of the sac. In regard to symptoms, it has been truly said that almost none of them is due to the aneurism itself, but most are produced by the influence of the tumor upon neighboring structures. A certain amount of dull pain may be due to the distention of the sac-wall itself, but this is usually entirely overshadowed by that produced by alterations in parts in the neighborhood. Of the signs of aneurism, it will be seen that in many cases those peculiar to aneurismal tumors are extremely often absent, and that for our diagnosis we must depend not so much upon the true physical signs of an arterial tumor as upon those due to an abnormal growth of whatever nature.

The typical signs of aneurism may be said to be tumor, expansile pulsation, thrill, bruit and shock. Tumor is frequently absent, expansile pulsation is in many situations impossible of detection, thrill is a very uncertain sign, bruit is as often absent as present, while shock, whether diastolic or systolic, is frequently absent in even well-marked examples of the disease. Tumor is, of course, always present, but in aneurism seated within the unyielding walls of the thorax it is beyond detection until the mass projects into a yielding region or attains a size sufficient to cause protrusion of the thoracic walls. Thus, tumor is greatly more frequent when the aneurism involves the ascending or the transverse portion of the arch of the aorta than when the descending portion is the seat of the disease, and it presents itself as a readily available sign of a small aneurism of the abdominal aorta that would not give rise to discoverable tumor if situated in the thorax until its size had increased to much greater proportions. Even in the abdomen tumor may be difficult of appreciation, when, as is at times the case, part of the true aneurismal sac has disappeared and the walls are formed by the surrounding tissues and organs in such a manner that lateral expansion exceeds forward projection. This absence of demonstrable tumor was well shown in one of my cases in which an aneurism of enormous

size was only discovered at autopsy, and wherein there was practically no anterior projection of the truly enormous aneurismal tumor.

Of pulsation somewhat the same remarks might be made as regards thoracic aneurisms, except for the fact that careful palpation will frequently allow of its recognition when the tumor is simply in contact with the chest-wall and has not as yet attained a size sufficient to cause bulging of intercostal spaces, ribs or sternum. The character of expansion can be determined in thoracic aneurisms only when tumor is present, inasmuch as while there is something about the sensation of pulsation from an aneurism that conveys a peculiar impression to the observer, yet true demonstrable expansion cannot be present until there is elevation above the surrounding surface. The eccentrically diminishing force of pulsation often suggests the existence of this characteristic of aneurismal tumors and the placing of slips of paper at opposite poles of the area of expansion will often render visible this property when tumor and expansibility are not otherwise capable of demonstration to eye or hand. Pulsation in deeply-seated aneurisms of the arch of the aorta may sometimes be detected by palpation downward in the episternal notch or by firm pressure upon the chest applied during expiration, one hand being placed between the scapulæ, the other over the sternum and front of the chest. The movement of a pulsating empyema closely simulates and suggests that of aneurism. It can, of course, be readily distinguished by the difference in the history of the case, by the absence of other signs of aneurism and by the presence of signs of fluid within the pleural cavity.

Thrill is absent with remarkable frequency, even in readily accessible tumors, while in those deeply seated and most difficult of diagnosis it is not capable of demonstration until other unequivocal signs of the trouble are readily determinable. Thrill, moreover, may be present without dilatation in cases of well-marked atheroma, while the vibration of an abnormally pulsatile aorta may readily be mistaken for aneurismal thrill.

Bruit likewise is an uncertain sign, and almost the same remarks might be made in regard to it as in speaking of thrill, substituting for the statement in regard to the pseudo-thrill of the abnormally pulsatile aorta, the false bruit produced by deep pressure with the stethoscope. Shocks, either systolic or diastolic, are of much corroborative value when present; but the systolic shock is frequently absent and the diastolic is only observed when the tumor is near perfectly competent aortic valve-leaflets.

In the thorax a valuable sign is furnished by percussion. An abnormal area of dulness in the neighborhood of the sternum or in the left spinal gutter is a sign that at once suggests the existence of aneurism; yet the same dulness may be furnished by any airless mass within the chest, and in many cases impairment of the normal resonance on percussion is only produced after the tumor has reached a great size.

Stokes happily puts it when he gives the signs of a typical demonstrable aneurism as those simulating the presence of two hearts beating within the chest; but if we wait for this appearance before making our diagnosis, many an aneurism will be overlooked.

In so far as diagnosis (and in fact also treatment) is concerned, the dissecting aortic aneurism can be left out of account, because the trouble is usually first correctly diagnosticated by the coroner's physician.

Of aneurisms of the thoracic aorta it has been well said that those of the ascending portion of the arch are the aneurisms of signs, those of the descending aorta are the aneurisms of symptoms, and when we bear in mind the anatomic relations of these two portions of the aorta to the chest-wall and to the other thoracic viscera, the reason for the aphorism is apparent.

Some of the signs of aortic aneurism are due to its being a portion of the circulatory system, and form a connecting link between those just considered as due to the tumor *per se* and those due to the effect of the tumor upon neighboring organs. Chief among these is the effect produced by an aneurismal dilatation upon the distal arteries. The interposi-

tion of a more or less elastic and more or less voluminous cavity between the heart and the peripheral arteries cannot fail to signally alter the blood-supply to the latter. In the first place, the original impulse imparted by the ventricular systole must be broken up or lost in the reservoir-like dilatation of the aneurism. On this account the first impact of the pulse against the finger gives the sensation of feebleness of projection, which sensation is graphically represented by the sphygmographic tracing of the arterial movement. The use of the sphygmograph as a means of determining this lack of cardiac impulse in the radial has been much less convincing to my mind than the tactile impression, because I fully realize the difficulties of accurate adjustment of the instrument upon symmetric arteries and always feel a doubt as to the accuracy of the tracing unless I can also appreciate the difference in the pulses by my finger. Delay in the pulse of one wrist, as compared with that on the other side, is readily appreciable, especially after we have practically made our diagnosis from other signs and symptoms, but delay in symmetric arteries due to an aneurism centrad to both of them is difficult to appreciate without the use of the apparatus of the experimental physiologist rather than of the clinician. The appreciation of a delay of hundredths of a second, as in the cases studied by Francois-Frank<sup>1</sup> and Albert René,<sup>2</sup> is much more readily determined by the kymographion and time-pendulum than by the average human sensorium.

Another sign of some value is the presence of the capillary pulse of Quincke, the existence of which is probably due to the large reservoir, into which the blood can flow back during cardiac diastole. Its significance is much impaired by its presence in aortic insufficiency and in some cases of simple uniform dilatation of the aortic arch. Inequality of the pupils from pressure upon the sympathetic fibers, proceeding from the lower cervical and upper dorsal segments of the spine, when present, is a sign of distinct corroborative value, but it must be

<sup>1</sup> *Jour. de l'Anatome et de la Physiologie*, 1879, T xv., p. 97.  
<sup>2</sup> *Gaz. des Hôpitaux*, 1880, p. 372.

borne in mind that any other mass or inflammatory process involving the same fibers can produce the sign, and also that congenital inequality of the pupils is by no means rare. Unilateral flushing and sweating are of more decided value, but they are, for some reason, less frequent than is the pupillary inequality. In regard to flushing and sweating, it may be found that their presence is intermittent, depending upon changes in arterial tension and consequent changes in the size of the aneurism and its resulting pressure.

Pressure upon the pneumogastric nerves will cause disturbances in the digestive organs, as shown by attacks of vomiting and diarrhea, but much more constant symptoms are presented by pressure upon the recurrent laryngeal branches that spring from this nerve and wind around the subclavian artery and the arch of the aorta upon the right and left sides respectively. The peculiar character of the voice and the clanging, metallic, ringing cough produced by palsy of one of the vocal bands from pressure upon these nerves may be an early and important sign of the lesion of the artery. The same symptoms may, of course, be produced by pressure from other growths or from palsy of one vocal band from other causes, yet it is so unusual for other growths to compress the recurrent laryngeal nerves, and unilateral vocal-band palsy is so rare, that aortic or subclavian aneurism should be eliminated from the diagnosis only after a most careful search for corroborative evidence of its presence. It would seem at first sight that the phrenic nerves ought to be more often affected than they are. The reason for their freedom doubtless resides in the soft cushion of the lung that prevents the exercise of undue pressure upon them.

Pressure upon the intercostal and lumbar nerves may be for a long time the only sign of aneurism, while the occurrence of an attack of herpes zoster should always suggest a careful examination for this condition.

Doubtless most of the distressing cough, and possibly some of the peculiar alteration of the voice may be due to

pressure upon the trachea. Owing to the intimate relations of the transverse portion of the arch and the trachea in the upper and smallest portion of the thorax, there is small wonder that the most marked group of symptoms of aneurism of the aortic arch are produced by the interference with respiration. The deviation of the trachea from its normal vertical position, the narrowing of its caliber from pressure of the growth cannot fail to cause more or less respiratory distress. Ulceration of the tracheal wall from pressure is rare, except by aneurisms large enough to be readily accessible to examination; yet it is important to bear in mind the possibility of this source of hemorrhage in cases of otherwise apparently causeless hemoptysis. The by no means infrequent presence of the signs of pulmonary consolidation from changes in the lung due to pressure upon the pulmonary nervous and vascular supply renders this fact the more important. Visible pulsating tumor is said to be at times present upon laryngeal examination, but considerable skill is required to get an image of the trachea without distressing increase of discomfort to the patient. Moreover, it is claimed by some that there is normally a visible pulsation communicated to the tracheal wall by the aortic arch, and a slightly distorted image might readily suggest the presence of tumor in addition to this normal pulsation.

\*|The pulsations of the aneurism may impart a peculiar whiffing interruption of the breath-sounds as heard by the ear or stethoscope held before the open mouth, or even audible at a distance from the mouth, in some cases of large aneurisms of the arch. Drummond's sign, elicited by placing the stethoscope over the manubrium, having the patient take a full inspiration and slowly allow the air to escape through one nostril, is due to the same pulsation imparted to the air-column by the aneurismal tumor.

Pressure upon the left bronchus gives us some extremely valuable signs of aortic aneurism. Even a small aneurism, if so situated as to press from above downward upon the left bronchus, will

cause rhythmic downward excursion of this tube. Such downward movement is felt by the trachea, and, as pointed out by Oliver and emphasized by Ross and McDonnell, can be appreciated as a distinct downward "tug" of the thyroid cartilage when the finger is placed below the beak of the larynx. Grimsdale, in the *Practitioner* for February, 1892, rather belittled this as a sign of aneurism and stated that he had found it in 51 out of 118 miscellaneous cases. Such a frequency would of course rule out this as a sign of value, yet on reading Grimsdale's article, one is impressed with the fact that evidently the slightest downward pulsation was included among his cases. The "tracheal tug" is well named and expresses the sensation much better than would the term downward pulsation. It is a distinct pull and, in aneurisms so placed as to produce downward pressure on the left bronchus, is not doubtful. Grimsdale's statement, that it was extremely often present on deep inspiration, would not impair the value of the sign if it is present without such respiratory effort. Ewart, with whom Grimsdale worked, in an article in the *British Medical Journal*, March 19, 1892, page 596, after stating the fact that he had found some degree of tracheal tugging in 28 per cent. of females, and 50 per cent. of males examined, admits that except in three cases of aneurism it was either doubtful or very slight or, in a few, moderate, and concludes by saying: "In my opinion the diagnosis of thoracic aneurism is not destroyed by the fact that slight degrees of tracheal tugging are to be observed in a large number of healthy individuals." I have in the last few months carefully examined for this sign about seventy-five cases of medical patients suffering from a variety of diseases, without once finding this sign present, save in those with other reliable signs of aneurism. Of course, the value of tracheal tugging as a diagnostic sign is limited, in that many aortic aneurisms are so situated as not to press upon a bronchus.

Cardarelli's sign of lateral movement of the larynx closely resembles that of Oliver, save for the direction of the

movement. Cavazanni<sup>1</sup> has lately reported a case showing it. It has been absent in my cases. A condition wherein its value is marked as a diagnostic sign is that, and it is not rare, in which there is a doubt as to whether a pulsating tumor is an innominate aneurism alone or one involving also the aortic arch. The presence of distinct tracheal tugging would decidedly influence treatment as well as prognosis. The value of the sign in this respect is well shown in the case reported by Osler in the *Canada Medical and Surgical Journal*, 1880, page 451.

Pressure upon a bronchus will, if marked, produce narrowing of the caliber of that tube and a consequent diminution of the amount of air entering the corresponding lung. As a result of this there will be diminished expansion, with enfeebled breath-sounds on the affected side, with sometimes the peculiar auscultatory phenomenon described by Stokes in his book on "The Diseases of the Heart and the Aorta", as though after the beginning of inspiration the breath-sounds over the affected side seemed to suddenly appear "as if a valve had been opened."

Long-continued pressure on a bronchus leads to retention of secretion, fetid bronchitis and bronchiectasis, while pressure on the bronchial arteries may lead to the onset of pulmonary tuberculosis or may produce gangrene of the lung. It is probably in part due to this pressure on the bronchial arteries, in part due to the injurious pressure upon the trophic nerves of the lung that the association of tuberculosis of the lungs with aortic aneurism is so frequent. A mistaken diagnosis of pulmonary tuberculosis might readily be made from the presence of hemoptysis, with cavernous breathing, when the former condition was due to ulceration of or rupture into a bronchus by an aortic aneurism that had produced damming up of secretion and bronchiectasis.

Pressure upon the esophagus is in many cases the cause of early and serious interference with the taking of food. Of course, any growth will produce the same

<sup>1</sup> *Gazz. degli ospedali edella Clin.*, 1895, No. 84, and *Centralbl. f. innere Med.*, 1896, No. 23, p. 60.

symptom if properly placed; but the association of dysphagia and persistent intercostal or deep-seated thoracic pain should invariably suggest the possibility of pressure by aneurism of the descending thoracic aorta. Schnell has suggested the idea of aiding in the positive diagnosis of these cases of aneurism by introducing a stomach-tube with a blind lower extremity, attaching this to a glass tube, filling the tube with water and noting the presence or absence of rhythmic rise and fall of the liquid from compression of the rubber tube within the esophagus. It is easy to conceive of possible grave dangers from resort to this method of diagnosis. This esophageal pressure is apparently frequently present in the rarer cases wherein there is pressure upon the thoracic duct. With this combination it is difficult to determine to which obstruction the wasting is due. It is possible that pressure upon the thoracic duct is accountable, at least in some cases, for the emaciation that is so frequently present in cases of thoracic aneurism and that this cause for the emaciation is frequently overlooked through failure to examine the condition of this duct and its relation to the tumor.

Pressure upon one or both innominate veins produces engorgement of the veins of, and edema in, the parts drained by the compressed vessels and will often aid in locating the seat of trouble, the "collar of flesh" being produced by this, as well as by other intra-thoracic growths, through interference with these veins. The sudden onset of this edema and of cyanosis of the upper extremities and head, with signs of aneurism, should always suggest the probability of an aortic aneurism rupturing into the superior vena cava.

The occurrence of coronæ of dilated venous radicles on the chest is common to so many conditions that its significance is merely general, but its presence is suggestive of intra-thoracic venous obstruction and calls for careful exclusion of aneurism as a cause for such pressure.

The sudden onset of paralysis, of hematuria, of splenic pain with enlargement of the area of splenic dullness, of melena and umbilical pain, with symp-

toms of intestinal obstruction, should cause one to think of the occurrence of embolism from the interior of an aneurism, just as it does of embolism from cardiac valvular disease.

To pressure upon and erosion of the vertebræ is due much of the pain of aneurism, as it is also in cases of eroding pressure upon the sternum, ribs or clavicles. The curvature that may follow such erosion should not be mistaken for that of caries from tuberculous destruction of the vertebral bodies. It is remarkable to what little pain extensive erosion may give rise in some cases, as in one of those reported in this paper.

Two signs remain to be mentioned. Scheele's sign needs only to be mentioned as it carries its condemnation on its face. Scheele found that by simultaneous pressure on the crural arteries of the two sides severe pain was produced in the region of the aneurism, with momentary disappearance of the systolic murmur over the tumor and enlargement of the mass. Such a proceeding cannot fail to be very hazardous, particularly as we have no positive means of determining the liability of a given aneurism to rupture. In fact, of Scheele's three cases reported in his paper the two in which such compression was practised died of internal rupture, while Saundby in the *British Medical Journal* for February 15, 1879, reports the instant death of a patient from rupture of an aneurism of the abdominal aorta after twice pressing upon the femorals for five or ten seconds. Such a risk is certainly one not to be lightly assumed.

A sign that may sometimes be found is the creaking sound discovered by Perez on auscultation over the sternum in cases of anterior mediastinitis when the patient raises and lowers the arm from the shoulder. In a foot-note to his article in the *British Medical Journal* for September 19, 1896, he states that he found the sign in two cases of aneurism of the first part of the arch of the aorta, and attributes its occurrence to mediastinal adhesions produced by the presence of the mass.

Glasgow's<sup>2</sup> sign I have failed to find

<sup>1</sup> *Berlin. klin. Woch.*, July 29, 1878, p. 446.

<sup>2</sup> *Trans. Amer. Climatological Assoc.*, 1896, x, pp. 324-331.

in the cases seen by me lately. It consists in the presence of a distinct systolic thrill in the brachial artery, similar to that appreciated in aortic regurgitation.

A brief glance at a few cases selected from those that have been seen by me within a short time may be not without interest.

Three patients and a specimen are before the meeting. The old man is a well-marked example of what has been called the aneurismal diathesis. He has been under my observation for two years at the Philadelphia Hospital and for six months before his admission to the medical wards was under the care of the surgeons with all of the paraphernalia close at hand for immediate ligation of the carotid artery in case of need. Finally the surgeons despaired of such intervention being necessary and sent the patient to the medical wards. He has a pulsating tumor on the right side of the neck of about the size of an English walnut, and a pulsating mass of about the size of an orange to the left of the navel. These tumors have been of the same size and character since he came under my observation two years ago and have been uninfluenced by diet, by rest, or by exercise and by drugs. He has a dilated aortic arch, as is shown by an extended area of dullness over the region of the aorta and a typical "bucket" second aortic sound, but there is no evidence of injurious pressure upon surrounding parts and I take it that the aortic arch is not the seat of aneurism, but of uniform simple dilatation. In neither of the tumors has their ever been bruit, thrill or shock; yet that they are aneurisms cannot be doubted.

The colored man applied for treatment at the out-patient department of the Pennsylvania Hospital on account of cough. He had a typical aneurismal clanging cough, which alone would almost have warranted us in making the diagnosis. Examination showed that there was no inequality of the pupils or of the pulses; that there was obstruction to the return of blood from the left arm, evidenced by the dilated and tortuous veins of the extremity; that there was decided dullness over the

upper portion of the sternum and the upper zone of the left chest in the neighborhood of the sternum, and distinct pulsation over the dull area. There is no bruit and no thrill. Distinct diastolic shock is appreciated on auscultation with the rigid stethoscope over the manubrium. Drummond's and Glasgow's signs cannot be elicited. Tracheal tugging is distinct and can readily be seen, as well as felt, while when I ask the patient to strongly extend the neck the downward jerk of the chin can readily be appreciated at a distance. Confirmatory evidence of pressure upon the left bronchus is furnished by the great feebleness of the breath-sounds over the left lung. The characteristics of this case were perfectly duplicated by a patient lately in my ward at the Philadelphia Hospital, in whom the diagnosis was provisionally made before the ward class on his admission, simply by finding tracheal tugging, ere any history was obtained or other examination made. Further investigation confirmed the provisional diagnosis.

The other patient presents slight irregularity of the pupils and of the pulses, tumor, pulsation, thrill and bruit over the manubrium sterni and in the first and second intercostal spaces to the right of the sternum. In this case Drummond's and Glasgow's signs are both absent; there is no tracheal tug, no inequality in the intensity of the breath-sounds on the two sides and no interference with swallowing. When I first saw the man in 1894 he was a patient in the men's medical ward of the Pennsylvania Hospital, and I have had charge of him on several occasions since that time. The area of pulsation, of tumor, and of dullness is much smaller now than when I saw him a year ago, but except for this apparent diminution in size there is no appreciable change in his condition since his first period of rest, with Tufnell's diet, had caused rapid and decided improvement. The typical aneurismal voice and cough have at times been present, but are now absent except after exertion. The position of the dullness and of the pulsation, without the presence of tracheal tugging, shows quite well in contrast with the



colored man, with dulness over the upper portion and to the left of the sternum, with this sign of pressure on the left bronchus.

The specimen that I present was removed from the body of a colored man who died a few days ago in my ward at the Philadelphia Hospital. I saw him first at the Pennsylvania Hospital in 1895, and find on looking up the notes made at the time that he was admitted during a severe attack of asthma. He then presented signs of an enlarged heart, with a systolic murmur at the apex, a systolic murmur at the aortic area and a hollow second sound in the same position. A low diastolic murmur was also heard down the sternum. The pulse was of extremely high tension. Considerable improvement followed the use of nitro-glycerin and caffeine. In January 1896 the man was again admitted to the Pennsylvania Hospital under the care of Dr. J. M. DaCosta. On December 28, 1896, he again came under my care in the Philadelphia Hospital. He was fifty-two years of age and a jockey by occupation. The essential points in his history are that he had had attacks of shortness of breath for three years, which seemed to be purely asthmatic. He denied venereal disease and excess in alcohol; but he had received severe injuries, none however involving the chest. On admission he was so distressed with dyspnea and the breath-sounds were so noisy and accompanied by so many râles that thorough and satisfactory examination was impossible. The presence of a large heart, with high arterial tension and mitral regurgitation, was, however, noted and he was put upon increasing doses of strychnin and nitro-glycerin. In the course of a few days his breathing improved and the following notes were made of the examination: He is a poorly nourished colored man, is sitting propped up in bed and using the accessory muscles of respiration. There is decided edema of the eyelids and the superficial veins of the neck are considerably distended. The respirations are very irregular, assuming at times almost the Cheyne-Stokes type, and at short intervals all attempts at examination have to be stopped while the patient leans forward in a paroxysm

of dyspnea. These paroxysms usually cease with a succession of loud, clanging, fruitless coughs. The pupils and pulses are equal; the radials are very leathery and the pulse is of high tension. The apex-beat is rather heaving and is most plainly felt in the left fifth interspace 11.5 cm. from the mid-line. Cardiac dulness begins at the upper border of the third rib and at a point two centimeters to the right of the right sternal border in the fourth right interspace. At the apex there is a loud, blowing systolic murmur, plainly transmitted to the posterior axillary line on the left side. At the aortic area the second sound is decidedly bucket-like. Over the upper portion of the sternum there is decided dulness, but no abnormal pulsation or thrill can be felt and there is no bruit. Tracheal tugging was searched for, but the pressure upon the thyroid cartilage produced such immediate dyspnea that examination was not satisfactory. Except for the presence of large bubbling, wheezing and sonorous râles, the examination of the lungs yields negative results, the air seeming to enter both lungs with equal freedom.

Two days later the notes state that tracheal tugging could be obtained readily, but that there was no apparent inequality of the breath-sounds over the lungs. Drummond's and Glasgow's signs were looked for, but were not found. Until his death on January 31, there occurred nothing of further interest, the dyspnea continuing to increase, the clanging cough persisting, and the cardiac signs remaining unaltered. On autopsy the heart and lungs were removed together. In the specimen herewith presented the aneurism can be well seen encircling the upper portion of the left bronchus, which, with the root of the left lung, has been preserved. The mechanism of the production of tracheal tugging is plainly to be seen.

A case showing the value of the less cardinal signs of aortic aneurism applied lately at the Out-Patient Department of the Pennsylvania Hospital for treatment on account of severe epistaxis which had occurred suddenly in the middle of the preceding night. He was a lawyer, fifty-seven years of age, and of temper-

ate (?) habits. His previous history was negative. Examination showed that he was a stout, rather flabby man, with very pallid mucous membranes. The pupils were equal and reacted well to light and on accommodation. The radials were decidedly leathery, the pulses equal and of high tension. The apex-heart was slightly displaced to the left and the second sound in the aortic area was very much accentuated; but in other respects the examination of the heart was negative. Over the manubrium and in the first left intercostal space there was decided dullness, but pulsation, bruit or thrill could not be obtained. Tracheal tugging was absent. Drummond's sign was distinct and clear. Glasgow's sign could not be elicited. The urine was very acid, its specific gravity 1022, and it contained neither albumin, sugar, casts nor crystals. The patient was put on calcium chlorid and nitro-glycerin, but with what result is not known, as he failed to report again. The hemorrhage occurred from the left nostril and may have been due to pressure upon the left innominate vein, as enlarged superficial venous radicles are noted as present below the clavicle on that side.

It is hardly worth while to enumerate other cases showing the value of the use of corroborative signs of obscure aortic aneurisms; yet, aside from cases showing the aid that their presence gives in arriving at a certain diagnosis, many cases could be cited in which the absence of these signs ruled out the probability of a deep-seated aneurism, when without examination for these, so to speak, accessory signs such a condition could not have been excluded.

A remarkable case of aneurism lately came under my hands on the autopsy table, and, while it concerned the abdominal aorta and not the aortic arch, it has already been referred to and is possibly worth relating. The man was admitted to the surgical ward of one of our hospitals for impermeable stricture of the urethra. He was a well-nourished

and apparently otherwise healthy negro. On the day after admission perineal section was performed; the stricture was divided from below, and a silver catheter was passed into the bladder. The perineal wound healed and the man seemed well, except for slight pain in the abdomen after eating. He was up and walking in the ward, when suddenly he fell over and died before the nurse reached him. To briefly summarize the autopsy record, the left pleural cavity was filled with clear serum and a firm blood-clot (from which the serum had evidently been expressed); there was a large rent in the left half of the diaphragm, which led into a huge cavity filled with grumous clot and uncoagulated blood. The anterior wall of this cavity was formed by the remains of an aneurismal sac, by the remains of the crura of the diaphragm and considerable adventitious connective tissue. The posterior wall was made up of the remains of the vertebral bodies, and the other tissues of the posterior wall of the abdomen. From the eleventh dorsal to the second lumbar vertebræ inclusive the bodies were eroded, those of the eleventh and twelfth dorsal vertebræ being practically destroyed, so that the intervertebral disc between them stood out prominently and like an isolated shelf of tissue. The vertebral canal opposite to the site of the eleventh dorsal vertebra was exposed, and the outer surface of the spinal dura formed a part of the posterior wall of the aneurism. The pelvis and the lower extremities could be readily rotated through a semicircle, the bony connection between the thorax and the pelvis being the transverse processes of the eleventh dorsal vertebra. How such extreme erosion could have occurred, with the retention of desire or ability to walk, it is difficult to see, while the aneurism caused so little discomfort that the man failed to complain of pain sufficient to attract to his abdomen the attention of the extremely careful and skilful surgeon under whose care he was at the time.

## DISCUSSION.

DR. JOHN B. ROBERTS spoke of a case that he thought, possibly, was one of aneurism, and whom Dr. S. Solis-Cohen had also seen, and he showed a skiagraph of the patient. She was a young woman in the early twenties and it seemed almost impossible that she could have an aneurism. Still, there were clearly pulsation and thrill in the upper part of the chest, which had been present for five years. It seemed that the patient should succumb, or the disease become much more pronounced if there were a thoracic aneurism. It appeared to Dr. Roberts that the case might be one of pulmonary aneurism. The skiagraph showed the shadow of the heart; and also the cardiac outline extending too far to the right, too far upwards and downwards. It looked almost as if the heart might be enlarged, and it was suggested that perhaps there might be an aneurismal condition of the heart-wall, that is, of the auricular or the ventricular portion. Dr. Roberts exhibited also a skiagraph of a heart which was not abnormal, although abnormally placed on the right side of the patient. The woman first spoken of had been assured some four or five years previously by her family physician that she had an aneurism and that she ought to keep quiet; but she has not kept quiet and is still alive, skating and participating in various forms of exercise, with apparently no harmful result. The condition is obscure.

DR. A. A. ESHNER said that, in addition to difficulty in swallowing, hematemesis from extravasation of blood into the esophagus may attend aneurism of the thoracic aortic. He referred to a case seen several years ago in which an aneurism, situated almost directly behind the heart, had gradually ulcerated into the esophagus and had given rise to repeated hematemesis. The appearance of the patient was so cachectic and he was so emaciated that it was suspected that he had gastric carcinoma. The aneurism was so situated that its existence was not betrayed by the usual physical signs.\*

Another sign that may result from aneurism, more especially of the ascending or transverse arch of the aorta, is a murmur due to abnormal communication between the artery and an adjacent vein, e. g., the descending cava or the left innominate. A case in which this condition was present was described some years ago by Pepper and Griffith.† The murmur was peculiarly high-pitched and musical and it was audible in diastole as well as in systole.

DR. WM. E. HUGHES said that in dealing with aneurisms of the thoracic aorta an attempt should be made to draw the line as

sharply as possible between actual saccular dilatations and general dilatations of the aorta, the prognosis being essentially different and the physical signs in some cases much the same. Probably the pressure-symptoms are the most valuable diagnostic ones here. Of the physical signs mentioned, Dr. Hughes was inclined to regard tracheal tugging, if present, as probably the most important individual one. While it is perfectly true, as mentioned, that an appreciable amount of movement can be demonstrated in perhaps one-half the cases one examines this is not an actual tracheal tugging, and Dr. Hughes has never yet seen this sign in connection with anything but an aneurismal growth. In the great number of aneurisms this sign will be absent, but when present it is an absolutely unequivocal one.

Drummond's sign is one that has not stood Dr. Hughes in good stead. He has heard in one case of dilatation of the aorta and in one case of mediastinal tumor, not aneurismal, a very distinct whiffing sound over the manubrium; and with the ear close to the open mouth during expiration, a sound may be heard that is not at all uncommon in association with normal aortas. Functional cardiac conditions seemed to be largely concerned in the production of these phenomena.

Paralysis of the vocal band is an extremely important sign of thoracic aneurism. Rather recently Dr. Hughes had a queer experience with a man suffering from unquestioned aneurism of the innominate artery, who had the distinctive voice of paralysis of the left vocal band, which cleared up absolutely after pretty large doses of potassium iodid. The condition was at first thought to be due to an aneurism of the descending portion of the arch of the aorta, but its clearing up threw doubt upon this diagnosis.

The capillary pulse is a very misleading sign, being present in many cases of anemia and in many cases of arterial or cardiac disease. Pupillary inequality is an exceedingly common condition, even in healthy persons, and it must not be relied upon solely in the diagnosis of aneurism of the aorta. To make such a diagnosis at least two or three distinct signs or symptoms should be present. The presence of left-sided pleural effusion is a valuable sign of aneurism of the thoracic aorta, pretty well down, from compression of veins on the left side of the vertebral column. As it is a perfectly well-known fact that in purely cardiac affections right-sided effusions are the rule, this fact is probably of moment.

DR. FREDERICK A. PACKARD said that there is almost no one sign, possibly no two signs, that enable the clinician to say absolutely and positively and definitely that there is intrathoracic aneurism. He can suspect and make a probable diagnosis, but to make an

\* *Medical News*, October 29, 1892, p. 494.

† *American Journal of the Medical Sciences*, October, 1890, p. 323.

absolutely certain diagnosis more than two signs are certainly needed. Certain of the signs spoken of can, of course, only be used as corroborative evidence. For instance, the capillary pulse is frequent in conditions other than aneurism, such as pernicious anemia, dilatation of the arch of aorta, and aortic insufficiency; and it is only in connection with other signs that it has the slightest significance in the diagnosis. In a case in which there is no suspicion of other cause for capillary pulsation, and there is one or another sign of aneurism, such as duplication of the heart-sounds in the chest, the symptom adds weight to the other sign, and therefore has some significance.

The patient with the aneurism of the abdominal aorta and right carotid artery cer-

tainly has a widely dilated arch, as is shown by dulness over the manubrium extending from a little to the right of the sternum and by the bucket-like second aortic sound, so characteristic of this condition, but he has no symptom or sign of aneurism of the arch of the aorta. Certainly in this case Drummond's sign ought to be present, if it is frequently present in people with normal aortas, yet in spite of careful search it could not be detected. Dr. Packard did not wish to be considered as attaching great value to this or to any other one sign when occurring alone, yet the positive diagnosis of aortic aneurism is frequently so difficult in suspected cases that it is well to bear in mind even the least constant sign that, taken in connection with others, could render the diagnosis more absolute.

## A GROUP OF SURGICAL CASES.

THOMAS S. K. MORTON, M.D.

[Presented February 10, 1897.]

### I.—GUNSHOT WOUND DIVIDING RIGHT SUBCLAVIAN ARTERY; DANGEROUS BURNING BY X-RAYS.

E. W., a hearty laborer, aged twenty-eight years, was shot by a man standing in front of and a little above him, at a distance of some twenty feet. He was not aware that he had been struck by the bullet except from the fact that the right arm fell powerless and without feeling at his side. In about five minutes he fell unconscious to the ground. While in this condition he was removed to his home and Dr. George M. Stiles, of Conshohocken, was summoned. It was then discovered that the ball had entered the neck through the outermost fibers of the clavicular portion of the sternomastoid muscle, immediately above the clavicle. Active treatment was directed to the shock, which persisted for many hours. When reaction had become established, it was further noted that there was no pulse in the entire right arm. At the end of six weeks the man was seen in consultation by Dr. Morton. At that time there was a barely perceptible pulse at the right wrist. The extremity, however, remained almost totally powerless.

From the direction the ball had taken, in conjunction with the sudden loss of pulse in the arm, it was evident that the missile had divided the subclavian artery in its second portion. The upper two-thirds of the right thoracic cavity was occupied by a mass, giving flat percussion-resonance and other signs of

blood-clot. This was supposed to be blood emptied into the thorax behind the pleura. It explained the interval of time between the reception of the injury and the syncope without external loss of blood: hemorrhage had taken place downwards behind the pleura.

It was determined to attempt the location of the ball by the X-rays, as no wound of emergence was to be found. Accordingly, the man was exposed to the rays for a period of two hours, while lying upon the photographic plate. This first attempt proving a failure, two days later a second exposure, of the same duration, was made. This plate clearly demonstrated the ball in the muscles of the right side of the back, immediately above the scapula, where it could subsequently be felt by careful palpation. After the first exposure, it was noted that a pink blush suffused the skin where the rays had fallen upon it. This was not at the time considered of importance. A few hours after the second picture was taken, however, the hue became dark red, almost livid, although no pain was experienced. On the following day the patient returned to Dr. Stiles' care. Almost at once the hair fell out over the whole pink area, extending from the middle line of the face below the right eye to the nipple, and from the anterior median line of the body outwards to

the anterior axillary line. A day later this whole area became raised in a huge blister, and later still the entire thickness of the skin and fascias came slowly away as great sloughs over a space about six inches square and exposing the great pectoral muscle.

At the time of exhibition, five months after the burn had occurred, an area two inches long and one and a half inches broad still remained open, in spite of every possible method of treatment, including skin-grafting. The clot in the right thorax had diminished to the size of an orange, and the lung had correspondingly expanded. There was good collateral circulation in the whole arm, and muscular power and sensation had returned so perfectly as to preclude the idea of injury to the brachial plexus. All hair was entirely absent over the whole area that had been exposed to the rays. Upon the neck a few

streaks of hair-bulbs were forming hair actively, but these evidently had been buried in wrinkles of skin as the man lay upon the plate. As the ball was doing no harm, it had not been disturbed.

Dr. Morton remarked that such a burn could scarcely happen now, with the short time necessary to skiagraph the trunk of the body by means of improved tubes and other mechanism. It is the only burn of moment that he has observed in the use of the Röntgen rays, and he considers it to have resulted from long exposure and close contact of the tube. The burn behaved in many respects like a frost-bite. The sloughs separated with the greatest slowness, and repair was exceedingly feeble, although there was nothing about the patient otherwise to explain the condition. He almost lost his life from the severity of the burn.

## II.—DOUBLE POPLITEAL ANEURISM; LIGATION OF BOTH FEMORAL ARTERIES.

E. J., aged sixty years, was admitted to the Pennsylvania Hospital on October 5, 1896. He is a bootblack by occupation, and stands at his work, stooping over to do the blacking. He reports having had small-pox, as well as rheumatism, many years ago, and also gives a clear history of syphilis fourteen years before admission. Eight years ago he was subjected to a terrible beating at the hands of two men, but he does not think his legs were injured. In September, 1890, he noticed a small, pulsating lump, the size of a bean, behind the left knee. "Drawing pains" in the leg attracted his attention to the tumor. This grew rapidly in size until he entered the hospital in January. The lump was then the size of his fist. Dr. John H. Packard diagnosed popliteal aneurism and ligated the left femoral artery at the point of election in Scarpa's triangle. Primary union took place and the man was discharged cured, five weeks later. Upon his second admission to the hospital, Dr. Morton found an aneurism of the right popliteal artery as large as a small orange, with much edema of the leg below the knee. The man stated that he had followed his work as bootblack since the previous operation and had been perfectly well until four months previously. Then recurring pains in the right popliteal space and leg began and steadily grew worse. He had only discovered the pulsating tumor a few days before, when he

was compelled to stop work owing to pain and inability to stand. There was an aortic systolic murmur. The urine was negative.

The patient was placed in bed, with the leg a little elevated, for two weeks, under treatment with mercury and potassium iodid. Then Dr. Morton tied the right femoral artery at the apex of Scarpa's triangle with three strands of silk after the method of Ballance and Edmunds, using the "stay knot," in which each strand is tied down separately for the first half of the knot and the three ends tied together as one for the second half of the knot. The entire extremity was then enveloped in cotton and hot bags were applied outside.

The limb was somewhat cold for a few hours, but it then warmed up, after which the man progressed rapidly to cure. Primary union took place and he was discharged, cured, at the end of four weeks, with a good collateral circulation and simply a hard mass the size of an egg in the popliteal space. This is still being rapidly absorbed and does not interfere with his work or walking. About four weeks after being discharged a portion of the cicatrix broke down and had an unhealthy appearance. Almost as soon as the man was again put upon mixed antisyphilitic treatment, however, this closed in. He has followed his occupation since leaving the hospital and reports himself as perfectly well.

### III.—TRAUMATIC RUPTURE OF INTERNAL MENINGEAL ARTERY; TREPHINING AND REMOVAL OF HUGE CLOT; LIGATION OF THE BLEEDING VESSEL.

Felix P., aged twenty-six years, a laborer, was struck upon the head by an implement of unknown nature on December 12, 1896. He fell unconscious instantly and was in that condition when brought to the Pennsylvania Hospital, some half hour later, by the Police Patrol. Soon after admission he regained full consciousness. When seen by Dr. Morton one hour after the reception of the injury he was able to converse freely and presented no signs of serious accident. The temperature was then depressed to 96.2°, although a half hour earlier it had registered normal. The pupils were equal and responded actively to light. There were no gross localizing symptoms. Upon the right side of the head at the parieto-frontal junction was a ragged wound. When this was opened a stellate depressed fracture of the skull was disclosed. For this indication trephining was at once undertaken.

A large horseshoe flap was turned down over the ear and with it the pericranium and temporal muscle. The skull was trephined and a number of loose fragments removed. Then it was discovered that a clot was presenting in the lower portion of the bone-opening, between the dura mater and the skull. Some of the temporal bone was rapidly cut away in a downward direction to more fully expose the extent of the clot. This was then found to be of huge extent, with the middle meningeal torn off just below its entrance into a bony canal, and active hemorrhage was still going on, not only from the meningeal, but from multiple little vessels in the separated dura and also from the denuded bone. The rongeur was again employed upon the temporal bone until an opening, in all about two inches square, was secured. This opening much resembled that employed for excision of the

Gasserian ganglion. It was then found that the dura had been stripped up to a most surprising degree, when it is considered that no pressure-symptoms were observed before operation. The clot was as large as a good-sized fist and had stripped the dura completely from the anterior fossa to the crista galli and longitudinal sinus, also from the middle cerebral fossa so as to expose the Gasserian ganglion.

The blood-mass was broken up by a finger and washed out by a stream of hot salt-solution. Then the middle meningeal artery was visible, actively bleeding and torn off, about an inch beyond the foramen spinosum. This vessel was at once ligated by passing a small Hagedorn needle through the dura mater, beneath it and tying down the catgut ligature that was thus carried under it. As hemorrhagic ooze was very free from the whole region whence the dura had been stripped, it was found necessary to pack the cavity with gauze. For this purpose two yards of three-inch wide iodoform-gauze was stuffed between the separated dura and the skull and the end brought out through a vertical slit in the middle of the large flap. The latter was then accurately sutured with silkworm-gut.

Practically no symptoms followed the operation. The packing caused no disturbance and was not removed for five days. Then it was taken out and the membranes at once bulged into the wound so as to obliterate the cavity. No bleeding recurred. A small piece of gauze was kept in the superficial wound for drainage for a few days longer and then omitted. At the time of exhibition the wounds appeared to be finally and soundly closed. There were no brain-symptoms and the man expressed himself as feeling perfectly well in all respects.

### IV.—STAB-WOUND OF ABDOMEN; FIVE WOUNDS OF INTESTINE AND MESENTERY.

A. N., aged twenty-six years, was admitted to the Pennsylvania Hospital on November 17, 1896, a few moments after having been stabbed with a large pen-knife in the left side of the abdomen. A flesh-wound of the pectoral region of no especial significance had also been inflicted. The abdominal wound was two inches in length, vertical, and just within the semilunar line, midway between the umbilicus and the pubis. One foot of small intestine containing a small wound was

protruding. When brought in, the man was grasping the prolapsed portion of bowel tightly with both hands. This, he stated, relieved the great pain in the parts. The prolapsed portion of gut was distended tensely with fluid and was tightly grasped by the margins of the wound through which it projected. There was great shock and considerable continuing hemorrhage from the wound of the prolapsed intestine.

Operation was undertaken by Dr. Morton

one hour after the infliction of the injury. As the wound was so large and so near the median line, it was enlarged to about four inches. Then the opening in the prolapsed bowel was sutured and the portion of gut returned to the abdomen after very careful washing with salt-solution. The descending colon bulged into the wound and presented a three-quarter inch wound, which was also immediately sutured by the method of Lembert. Then the bowels were systematically searched for other wounds. Beginning at the cecum, the colon was followed down to the rectum, but no other wound was discovered. Returning to the cecum, the small intestine was rapidly passed through the fingers without bringing more than two or three inches outside the abdominal walls at a time. In what was supposed to be the upper portion of the ileum two additional wounds of the bowel were discovered, in addition to the one already repaired. These were likewise stitched up. Another wound, but only penetrating the serous and muscular coats of the small intestine, about three quarters of an inch long, was found and also united. One wound penetrating through the mesentery was found in the same region

and stitched by through and through interrupted sutures, which stopped a very free bleeding from the severed mesenteric vessels. The systematic examination of the remaining small intestine upwards to the duodenum was then completed. The bowels were empty, except the foot of small intestine that had been prolapsed. This latter was distended with perfectly clear serum to the extent of many ounces, which resulted perhaps from the engorgement of blood-vessels incident to the strangulation. No extravasation of intestinal contents had taken place into the abdominal cavity. All of the manipulations were conducted under a stream of hot salt-solution and gauze pads were placed about each wound as it was sutured. A copious douche of the whole peritoneum completed the operation. The parietal wound was united by interrupted silkworm-gut sutures.

Recovery was uneventful and most satisfactory. The bowels moved on the second day and regularly thereafter. Primary union of the abdominal wound was secured. Four weeks after the operation the man was discharged, entirely well, and he had so continued up to the date of meeting.

#### V.—DIFFUSE OSTEO-MYELITIS OF FEMUR; PROFOUND SEPSIS AND METASTATIC ABSCESS OF LUNG; HIP-JOINT AMPUTATION; COMPLETE RECOVERY.

G. J., a farmer, aged thirty years, was brought to Dr. Morton in June, 1896, by Dr. George L. Romine, of Lambertville, N. J., with the following history:

His family record was negative. The personal history was also negative until December 15, 1895, when he accidentally cut himself slightly with an ax over the left patella. Three stitches were applied by a local physician, without antiseptic precautions. In forty-eight hours swelling and suppuration were noted. These were followed by diffuse cellulitis of the surroundings and, a day or two later, infection of the pre-patellar bursa and also of the knee-joint. Sepsis, profuse discharge, and great suffering continued until February 1, 1896, when the man passed under the care of Dr. Romine, who promptly made free incisions about the knee and upwards along the thigh in various places as high as the trochanter. At that time it was evident that the knee-joint had been hopelessly destroyed. The whole limb was twice its natural size as a result of swelling, and the knee was flexed rigidly at a right angle. Much pus was liberated. Under this free drainage and antiseptics the temperature declined and all other symptoms were much ameliorated. One week later a pneumonia (probably septic-em-

bolic) of the middle and upper lobes of the right lung took place. This threatened the patient's life for two weeks, during which time great quantities of blood and pus were expectorated. A large cavity resulted. The condition improved somewhat for a time but later remained stationary. Then abscesses began to re-form and the man rapidly lost ground.

On June 1 the man was seen by Dr. Morton. At that time a large cavity was present in the middle lobe of the right lung. Expectoration was profuse and cough severe. The left femur was enlarged to twice its normal size as far up as the trochanter. The knee-joint was evidently totally destroyed. The whole thigh and popliteal space were riddled with pus-collections and septic sinuses. The urine was found to be normal. The expectoration was repeatedly examined for tubercle-bacilli, but none was discovered. A diagnosis of osteo-myelitis of the femur to the trochanter was made and, after most careful consideration, it was determined that the only chance to save the man's life lay in removal of the whole cause of his troubles—namely, to perform a rapid hip-joint amputation and to trust that, with improvement in the general condition and removal of the chief source of sep-

sis, he would be able to rally and to heal the lung-cavity. Sepsis at this time was profound and the patient was reduced to a mere skeleton.

On June 5, he was given chloroform and oxygen and a hip-joint amputation after the bloodless method of Wyeth was performed with rapidity. In this method skewers are passed through the soft parts of the upper thigh and a long piece of rubber tubing is tied tightly several times about the hip above the pins. By this maneuver a perfectly dry amputation was performed and not two ounces of blood were lost. All of the vessels of any size were tied before the tourniquet was loosened. A few more ligatures for smaller vessels were required when the band was taken off. The stump had remained absolutely dry until the tube was removed. The incision employed was of racquet-shape, beginning at the anterior superior iliac spine. The wound was sutured in a vertical line, with a rubber drainage-tube of large caliber going through its center down into the acetabulum.

The patient reacted well from the operation and had no bad symptom during convalescence. Primary union resulted in the entire stump, save at the outlet of the drainage-tube, which granulated. From the moment of severance of the infected extremity the man began to gain flesh and strength and the lung-conditions were altered for the better. Five weeks after the amputation he returned to his

home and has since continued to gain flesh steadily. At the time of exhibition Dr. A. A. Eshner reported that no signs of cavity remained in the lung. The stump was sound and painless.

The amputated extremity showed destruction of the knee-joint by septic arthritis; almost no cartilage remained. The patella was also largely destroyed. The periosteum was much thickened and separated from the femur almost to the trochanters; between it and the bone there was pus. The whole cavity of the medulla of the femur showed breaking down and depots of pus as far up as the trochanters.

Dr. T. J. Mays asked whether, in the case of fracture of the skull, the electric reactions were investigated and for how long the temperature was depressed. In the case of stab-wound of the abdomen, Dr. Mays suggested a very important lesson might be learned from the discharge of serum from the intestines in this case. It would seem that a branch of the splanchnic was involved, as it has been shown that injuries of certain branches of this nerve are attended with a copious discharge of serum.

Dr. T. S. K. MORTON said that the muscular reactions were not tested in the case referred to. In the case of stab-wound, the serum was present only in the coil of intestine that had been prolapsed and strangulated by the patient grasping it in his hand tightly.

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## THE HOSPITAL, THE DOCTOR, AND THE COMMUNITY.\*

EDWARD JACKSON, M.D.

[Read February 10, 1897.]

Besides the Almshouse, there were in Philadelphia, in 1871, seventeen public hospitals, with a joint capacity of about 1200 beds. In 1896, these seventeen hospitals had increased their capacity to over 2000 beds; and fifteen other hospitals, established during that period, had a capacity of 1000 beds. In this interval of twenty-five years the increase in the bed-capacity of the Philadelphia hospitals was thus 150 per cent. In 1871 the total number of patients applying for relief at the hospitals and dispensaries of Philadelphia, and entered

upon their books as new patients, was about 75,000. The figures for 1896 are not yet all available, but from those which are and from those of preceding years, the number of similar cases for the last year was over 280,000, an increase in the quarter century of 250 per cent. During the same period the increase in the population of the city has been about 75 per cent.

No part of this growth can be accounted for by an extension of the territory from which hospital-patients are drawn; for during the same period, the



organization of hospitals and the extension of free medical service has gone on even more rapidly in the smaller cities and towns of the region from which Philadelphia draws hospital patients than in the city itself; and the same rapid extension of institutions for public medical relief is to be noted in other large cities. For instance, it is stated that over 700,000 patients were treated at clinics, dispensaries and hospitals in New York City in 1895—39 per cent. of the population. Nor does this movement show any signs of abatement. In one of the newest of these institutions, the hospital and dispensary at 1212 South Third Street, established by Alumnae of the Women's Medical College of Pennsylvania, which completed its first year October 31, 1896, the number of new patients treated up to the present time is over 3000, and since July last has averaged 300 per month. In the Philadelphia Polyclinic and in Wills Eye Hospital the increase of out-patients last year was from 27,560 to 30,320, or 10 per cent. It would be easy to calculate at this rate of progress how many years must elapse—considerably less than an ordinary life-time,—before the whole community shall receive free medical treatment at public institutions. Such a calculation, however, can do little more than call attention to the direction of our social movement, and the rate at which we are going. To do this, the simple figures regarding past years are quite sufficient.

No one who has much acquaintance with public clinics need be told that their statistics are far from accurate; but the inaccuracies are not such as to lessen the weight of the figures in this connection. Inaccuracies of the same kind, and of about the same extent, occurred in the figures of twenty-five years ago that occur in those of the present time. If, on the one hand, we have the same patients applying at more than one clinic and therefore, appearing twice or oftener in the figures for any one year; on the other hand, we are constantly encountering patients who return after an interval of two, three or five years, during which they have not figured in the statistics of any hospital, although

they still constitute a part of the community depending on public institutions for medical relief.

Is not a phenomenon of such scientific, professional and social importance worthy of careful study? Not that it has up to this time escaped notice, but it certainly has failed of the kind of consideration of which it is worthy. Some fifteen years ago a committee of this Society studied it and found that the hospitals and dispensaries were then treating about 125,000 persons *per annum*. The committee also reported a list of carefully-investigated cases of persons able to pay for medical attendance who had appeared among the applicants at the public clinics. Here, apparently under the impression that it was a matter only needing to have attention called to it, the report, and the action of this Society, left the matter. In all the time since then the "abuse of medical charity" has been a stock subject upon which, when other subjects failed, our medical editors were able to hold forth with perfect certainty of gaining the attention and sympathy of their readers, for their eloquent denunciations of the grasping hospital-surgeon and the unworthy patient. More than fifteen years ago the Society for the Organization of Charity got into working order and was looked to with hope by some of us as likely to check the swelling torrent of public medical relief. It has found important work that needed to be done, and has continued to do it in a way that demonstrates its value; but its influence in checking the growth of the free clinic has not been perceptible. Is it not time to give the matter more deliberate and earnest attention—not to join in shouting more loudly against certain supposed delinquents or for some alleged panacea; but to carefully study the probable causes of this tendency, its damages and its benefits, how far it is probably self-limited; and to what extent its operations can be rendered less harmful and more beneficial.

With regard to causation, it seems to me clear that the ambition of hospital surgeons and managers, and the readiness of a large part of the community to become impostors, are not sufficient to

account for this development; or if they do partly account for it, the conditions that permit such a movement to grow from such causes demand very early and earnest attention. It seems probable that the rapidity of the change may be due to the removal, during the last generation, of certain influences that, up to that time, restricted the growth of medical-relief institutions.

The repugnance of persons to submit to treatment in a public institution has probably been greatly broken down by other recent changes in our social life. For instance, the public school predisposes a large part of the community to regard with more favor public hospitals, which also are largely supported by the public purse. The massing together of great bodies of men in the army, and the treatment of the sick in army hospitals during the civil war, familiarized the mass of people with such institutions, and constituted another agency in overcoming that repugnance. Perhaps an even greater influence has been exerted by the complete change in hospital mortality—statistics wrought by antiseptic and aseptic doctrine and practice. In other days the enormous mortality among hospital cases, as compared with even the private practice of that time, was a powerful reason why philanthropists should hesitate about building hospitals and patients should object to running the risks of treatment in them.

In addition to the foregoing, there is this special reason: More influence than ever before is exerted by the advantages to be derived from division of labor. Specialization, which is going on with enormous rapidity in all other departments of labor, has worked great changes in the medical profession. Specialization in the hospital, or some equivalent not yet worked out, is as necessary in medicine as the factory, with its organization of labor, in the domain of manufactures. It is a fact, too, that many cases are treated better in hospitals to-day than they ever have been anywhere else—better treated, in many respects, than they can be in private homes, except in those of the very wealthy. It is a fact that with hospital

organization, more patients can be treated with the same amount of labor. A large proportion of the community does now receive medical aid of a kind it never received before and that it could not receive through any other method yet reduced to practical working. Even in private hands the machinery of the hospital—the private hospital—greatly increases the efficiency and lessens the labor of the few who are able to adopt it. The medical profession may as well recognize—and the sooner the better—that organization, co-operation, and the necessary plant of buildings, instruments, apparatus, etc., with subordinates and assistants, such as we have in the hospital, are more efficient for dealing with the diseases of the community than isolated, individual efforts; and, being more efficient, that it is not going to be given up, but will be more and more generally adopted.

When labor-saving machinery began to be widely introduced, it met with violent opposition. Those it displaced opposed it with riot and destruction. Experience has shown that such opposition was perfectly useless, so that to-day a closely organized trade like that of the printers' submits, without protest, to the introduction of machines for type-setting. The hospital is an enormous machine for the relief of sickness and deformity. The members of the medical profession are too intelligent to seriously oppose its extension, however keenly they may feel the danger to their personal interests; but are they not intelligent enough, can they not be sufficiently united to accomplish the more difficult task of controlling it, and securing, with the maximum benefit to the community, some share of benefit to themselves?

A great hospital organization at the command of every doctor is, of course, an impossibility. This being so, either the hospital must be controlled in the interest of the general body of the profession and the public by their participation more or less directly in its management, or it will be controlled in the interests of a few to whose interests all others will be subordinate. This latter is too largely the state of affairs at the

present time. It is not a pleasant situation to contemplate, and the contemplation is very prone to produce pessimism such as this, from a recent editorial:\*

"The remedy! None is available. Experience has repeatedly shown us that *unanimous* and *persistent* action on the part of doctors is impossible. Let a board of governors of any hospital or dispensary dismiss its attending staff because of a meek and proper assertion of rights; and however flagrant and arbitrary the action, other doctors will fall over each other in their haste to thrust their necks into the apparently welcome yoke.

"The average doctor is servile and short-sighted to an extraordinary degree, bent not only on his own destruction, but also upon endangering the entire fabric of a noble and benevolent profession. Even plumbers and members of other trade-unions protect themselves by curtailing apprenticeship and by keeping out ignorant cut-throats. Why shouldn't doctors? But it is too late! Even now, as we near the vortex of muddy competition, and as we are about to go down for the last time, we must acknowledge a bitter justice in our fate; for years of neutrality and final servility have taught pompous laymen, who pose as public benefactors and philanthropists, that doctors will stand any amount of robbery and degradation to secure and keep a hospital or dispensary position."

The difficulty seems to be that at present the hospitals are controlled by managers absolutely irresponsible to the medical profession, or to the general public—responsible to nothing but their individual ideas of right and wrong. Commonly they are entirely ignorant as regards medical and surgical practice; and equally deficient in appreciation of the influence that such institutions exercise on the general profession and the community. The policy of these institutions is guided by crude social ideals formed often in very narrow spheres of life, supplemented as to technical points by the opinions and influenced by the

private desires and interests of some few members of the medical profession.

The present system of hospital organization and government grew up at a time when the general profession thought it was not worth attending to and was itself entirely without organization. Now, the writer just quoted thinks it is impossible to change this. I believe that he is in error. I believe that, while it is no small undertaking, it is possible, and now easier than it ever would have been before, to make the hospital in all things the direct servant, and in nothing the enemy, of the community and the profession.

Before proceeding to outline certain points for discussion, a word should be said as to the rapidity of this extension of hospital service. Any change in social organization works hardship to some portion of the community. If it be slow and natural, the hardship is comparatively insignificant. If it be more rapid, the hardship increases and is keenly felt. If it is more rapid still, hardship increases with even greater rapidity, and social disorganization and revolution result. This is quite true of the change from the treatment of people by private physicians to their treatment in public hospitals. On this account any artificial or forced acceleration of the movement should be opposed. Such forced acceleration is accomplished by the unnecessary multiplication of hospitals, the increase of their patronage by extensive advertising, or the urging strongly of the advantages of hospital treatment upon those who are satisfied with treatment at home. On this account the following circular, printed in English and German, and apparently for general distribution, should, it seems to me, meet with a distinct and emphatic protest:

"THE BOARD OF TRUSTEES OF THE GERMAN HOSPITAL OF THE CITY OF PHILADELPHIA STRONGLY RECOMMENDS THE FOLLOWING ADVANTAGES OFFERED TO THE PUBLIC:

"Mill and Factory Owners, Lodges and Beneficial Associations can secure a bed at the German Hospital for 365 days by paying \$200, and upon averag-

\* *Medical News*, December 19, 1896.

ing the days, may have several patients in the hospital at the same time.

"SUBSCRIPTION BOOKS can be obtained by working people of both sexes up to the age of fifty, subject to the regulations of the hospital, whereby, on paying an initiation fee of one dollar, and monthly instalments of fifty cents, each subscriber may be treated, in case of sickness, entirely free of further charge. Heads of families and owners of factories should particularly recommend to their servants and employes to avail themselves of this excellent facility."

The influences favoring the rapid increase of hospital services that we can most profitably discuss here are those exerted by members of the medical profession. One such influence, exerted by the ambition of the hospital physicians and surgeons for large clinics, has been so largely dwelt upon in most of the discussions of the subject that it need only be mentioned here. Another side quite as worthy of attention has not been so often spoken of. This is a tendency sometimes shown on the part of the family practitioner to regard his patients as his particular source of private income, while he is at the same time perfectly willing to assist them in any effort to get the benefit of free treatment from other members of the medical profession. At the Philadelphia Polyclinic it has been a common experience to find a patient in a special clinic needing treatment also in the department of general medicine; and, after referring the patient to that department, to receive an angry letter from some general practitioner who feels very badly treated, because one of his good patients, who always paid a moderate or fair fee, and whom he himself sent to the special clinic, has been referred for general treatment to somebody else instead of being sent back to him. In other words, there are medical practitioners—and apparently a good many of them—who regard it as perfectly legitimate to send their patients to a free clinic for advice regarding any particular ailment that they do not themselves undertake to treat. That such infidelity to common honesty and common professional interests sometimes

overreaches itself, and always tends to the loss of private patients in the public clinic is obvious. Perhaps it is not generally appreciated what an influence such an attitude on the part of many doctors exerts in determining the way that treatment at public clinics is regarded by the community. Sometimes the instances of this seem very aggravated; as when recently a very well-to-do saloon-keeper from a neighboring city came to a hospital, instructed by his physician to get as definite advice as possible and bring it, with all prescriptions, to the physician, who would then carry out the treatment, and be paid by the saloon-keeper for his services. In another case, the patient frankly stated that he was going to pay for his treatment at the hospital. When told that no charge was made for treatment there and that pay-patients could not be treated, he said that he understood that; that he did not mean to pay the hospital, but that he was going to pay the physician who referred him to the public clinic for each visit he made there. If this is the attitude of supposed members of the medical profession, what can we expect from laymen, who are not above the average of intelligence and thoughtful discrimination.

While we may be able to render important service in the way of diminishing the rapidity of the movement from private to hospital practice, all we can do in this direction will be far from solving the problem presented in the rapid growth of hospitals. If, as I believe, and as even those believe who see in it nothing but evil, this growth is destined to continue, it is evident that the medical profession must find some new relation to hospital administration, and that hospital administration is too important a matter to be left entirely to the control of those who, having little else to do, find in it a means of combating *ennui*, and an easy method of securing the self-satisfaction and respect that go with a supposed public service.

To render discussion definite and practical the following points are suggested:

That all hospitals, or other public charities receiving State aid, even to the

extent of exemption from taxation, should be directly accountable to the State, and be controlled by definite legislative enactments, or better, by direct representation of the government in their boards of management.

That among the managers of every hospital there should be a certain proportion of members of the medical profession—not to represent their own or any other private interests, but as representatives of the profession, and directly chosen by it.

That the management of hospitals should be so changed as to effect a wider distribution in the profession of the opportunities of hospital chiefs, by limiting terms of service and breaking up the practice of giving many such

positions to one physician or surgeon, whose assistants do the work that magnifies his reputation, while they grow gray in subordinate positions.

That medical men should consider, discuss and carry forward such plans of organization as promise the same benefits as public hospital and dispensary services, yet avoid the extension of pauperism and the deficient compensation of the physicians who do the work.

That, in the organization of the Pay Hospital for Contagious Diseases in which this Society is now interested, its direct permanent participation in the choice of the management, and the opportunity for every one of its members to treat therein his patients, should be insisted on.

## DISCUSSION.

DR. MORDECAI PRICE said that this is a far more serious question than most of the profession are willing to admit. When it is remembered that \$33,000,000 were spent for charity in the United States in 1896 from public and private treasuries, from charitable individuals and subscription, and when it is remembered that the State of Pennsylvania alone contributes millions from her treasury to hospitals throughout the State, it can well be appreciated why the medical profession is suffering. When it is remembered that these millions are being used by a class that has succeeded—by influence, political and otherwise—in getting not one but numbers of positions in hospitals supported by the State treasury, supported by public charity, supported by the poor as well as the rich, and when it is remembered that nine times out of ten if one wants a bed for some poor wretch suffering from an incurable trouble, no place can be found for him, and he is left dependent upon the charity of his neighborhood and neighbors, while his poor family, already at poverty's door, is further oppressed by his care and his medical support, the magnitude of the question must be obvious.

The State has no right to contribute a single cent except for the hospitals that will admit tuberculous, carcinomatous, and alcoholic cases. It has received millions from the sale of alcoholics alone, and it is alcohol that throws the victim upon the public and upon the poor wretch's family, who have to support a vagabond who is of use neither to the public nor to his family. This seems to be the place for State charity, or for public charity—the

care of the man who has already gone beyond correction, and not to leave him a public care upon his neighborhood, or an added burden to the poor woman who married him in a better day, or to his poor children. The State, through alcohol, has made him partly what he is, and it should take care of him. The profession is individually able to take care of the curable cases and should be permitted to do so.

DR. GEORGE M. GOULD said that the profession in general has a clear knowledge of the motives and of the methods by which State endowments for hospitals and many other endowments are secured. Dr. Jackson's position is a very commendable one, but it is suggestive of the member of Parliament who moved that all people be made good. All people will not be made good, and this abuse is certain to go on in spite of all that can be done. All great reforms have come down to this: Individuals must be reformed. This abuse will go on, and every day shows that it is increasing. In a recent newspaper report about dispensary abuses in New York, Dr. Landon Carter Gray is credited with possessing statistics showing that over 700,000 patients received medical services at the New York hospitals and dispensaries during 1896.

This, of course, is simply absurd; Dr. Gray goes on to give illustrations, *e. g.*, how the president of one of the municipal railroad corporations was identified as a regular attendant at one hospital.

The matter is one to be settled between doctors in private practice and the hospital doctors, and Dr. Gould's method consists in

doing his own charity work in his own private practice.

Dr. Jackson seems to make a great mistake in not differentiating between the in-patient and the dispensary patient; it is the dispensary patient that causes the trouble. The hospital abuse will rectify itself as regards the in-patient by the inability of the State and the hospital to support these patients in great numbers and for a lengthy period; by the simple natural process of atrophy it will wither. But the dispensary abuse, the out-patient department—that is the crying evil.

There is no question that nine-tenths of the patients treated should have been the patients of the young, growing, and needful men, and one might well say to the young medical man, "Go into competition with the hospital doctors! Tell your patients that they cannot get the best medical treatment in the hospital." Often the best medical treatment cannot be given, at least is not given, in dispensaries.

DR. M. V. BALL said that the whole matter seems to be one of economic evolution. The individual shoemaker has been wiped out by the shoe-factory, and it seems only a question of time when the individual doctor will be wiped out by the hospital institution. This is, of course, an undesirable result, but it seems to be inevitable. In cities to-day many diseases are seldom treated by physicians; the surgeon seldom sees an amputation outside of the hospital; contagious diseases are largely treated in hospitals; even typhoid fever is better treated in a hospital. In course of time all such cases will be treated in hospitals. The fact illustrates the trend of affairs; it is the same as the department store wiping out individual stores. The hospitals will receive State aid and will receive it more and more. The evil is that hospitals which receive aid from the State are not controlled by State officials. So many thousands of dollars go into the control of institutions which are not in actual need of it, while hospitals, like the Philadelphia Hospital, are in great need, and poor people who require its treatment are unable to obtain aid. Other hospitals have lots of empty beds and they receive the appropriations which should properly go to State institutions. The sooner the matter is looked at in this light, that it is but a manifestation of the great industrial evolution that is going on, the sooner will physicians arrange their affairs to suit the problem.

DR. JOHN B. ROBERTS said that a few years ago, at a meeting of the American Academy of Medicine, a series of discussions were held upon this same topic, and one thing that he learned was this: In the New England Hospital for Women the officers quite successfully correct the dispensary abuse. The plan, as related by Dr. Culbertson, is as follows: When a patient applies for treatment, she is given a paper to sign stating that she is poor; after treating her once, they say: "We won't

treat you again here as a free patient unless you bring a second paper signed by two reputable citizens stating that you are unable to pay a doctor." This plan has greatly decreased the returns of patients who do not care to sign the statement saying that they are poor if they are not; and they will not come back if they have to bring a signed statement that they are unable to pay. In this way only proper subjects receive charitable treatment.

Some institutions, because they are teaching institutions, prefer to have all patients come. The patients, in exchange for free treatment, submit to the personal discomfort that comes from being discussed before and exhibited to students.

Dr. Roberts differed from the view expressed that treatment in hospitals is inferior to that received in private practice. Patients at hospitals do often, perhaps usually, get better treatment than they would obtain from some graduates of medical schools. For many years, in Philadelphia and elsewhere, colleges graduated students who were not competent, and patients soon found that they could be better treated by going to hospitals than by going to some private practitioners who would take from them a moderate fee. They were compelled, in order to be cured (particularly at a time when most physicians were often ignorant of the specialties of medicine), to go to men with hospital experience. They could not go to a man with a high reputation except in a hospital. Why? Because he put his fees at such a point that they were prohibitory. This is one agency that has driven many patients in moderate circumstances to the hospitals. They desired to save their health and grasped at the opportunity presented. It was a choice between a doctor who would ask a very high fee, who, however, had a great deal of experience and knowledge, and a doctor who would ask a small fee, but would do them little good because of his imperfect knowledge.

The profession itself is largely to blame for this condition of affairs: First, for its ignorance; second, for its cupidity. Dr. Jackson is probably right when he says the medical profession must control this thing themselves; it must not expect Legislatures to control it or the public to control it. The doctor must first become competent; second, he must treat patients for a moderate fee if necessary, or without pay.

The establishment of small hospitals in the smaller cities and towns has been of great benefit to the public and has added materially to the average ability of the medical profession. Formerly, no physician could get even a moderate experience in surgery or the specialties unless he lived for some time in a large city. Hence, dwellers in the small towns and rural districts had, as a rule, to travel long distances and expend much money to obtain

good surgical or special professional service. The poor in these districts were almost shut off from this service, unless they had friends willing to send them to the cities. Now, the local doctor has the benefit of a hospital, with nurses and appliances, to put into practice the teaching he has received or the skill and methods he has developed, and, as a rule, the poor of the country receive better and earlier treatment. The well-to-do of the same regions have the advantage of doctors of wider experience, and the average ability of the whole medical profession is increased. These semi-rural or rural hospitals do good work for the profession and humanity, though they do reduce the income of the metropolitan doctors by lessening the number of consultations.

DR. HENRY BEATES, JR., said that the point that hospital staffs have acquired a skill and practical knowledge greater than the average general practitioner, if based upon the fact that by reason of trained experience the condition obtains, is well taken, and, as a consequence, superior treatment is given in hospitals. On the other hand, a private practitioner who, by special endeavor, has possessed himself of a similar degree of knowledge and skill, can just as successfully cope with disease as the man of the institution. After all, one phase of the question resolves itself into this: the comparative merit as to ability. The great defect universally present in the profession consists in its not possessing practical knowledge. If one will but think of it for a moment it becomes self-evident that graduates, as a rule, leave college with that knowledge only which is chiefly the fruit of didactic teaching. They have too frequently simply memorized the facts thus imparted, and understand as much of the words they repeat as does the cylinder of the phonograph the impressions made upon it. The serious and all-important question presenting itself to the profession, therefore, is how to bring about those conditions that will enable the utilization of clinical material in eleemosynary institutions available for the proper instruction of medical students, that is, practical teaching. It behooves every physician to enlighten the citizen of influence in each household, and endeavor to remove that morbid sentimentalism which prohibits the free patient in a hospital from being properly made use of for this type of teaching. It is not right to reflect upon the standard of the Faculties; neither is it right to condemn the conscientious student for shortcomings when conditions are such that it is impossible to impart and receive practical instruction. When the great Philadelphia Hospital has its doors opened for practical teaching, this sharp line of demarcation, differentiating the hospital physician from the average private practitioner, will rapidly disappear, and with it many collateral and objectionable features.

DR. ROBERT COYLE thought that the medical profession is at the present time in a state of evolution, and the hospitals, as conducted, are preparing the way for a still further evolution. As has been stated, there has been a marked increase in the number of free patients, and the hospitals are making the path clear for the admission of all classes of persons, rich and poor, or for their treatment in the dispensaries. There will come a time when the people will have some influence at the State Capital, when the politicians will no longer control affairs, and the question no doubt will be in time: "Why not utilize the \$2,000,000 or \$3,000,000 appropriated to support hospitals under control of State officials?" The time will come when physicians will be appointed to look after certain localities—the same as we have the skeleton of in the Guardians of the Poor; that is, the State Government will have a paid medical staff organization, similar to the medical branch of the army, or like the medical service connected with the Department of Charities of Philadelphia, but with much larger capacities.

In this process of evolution nothing that the profession can do will prevent the increase of hospital or dispensary work, and until the State shall build and control its own hospitals the medical profession will witness the opening of many new hospitals and dispensaries.

HON. JOHN W. MORROW, M.D., of Harrisburg, Pa., said that while not a member of the Committee on Appropriations of the Pennsylvania Legislature, yet he heartily endorsed the remarks made by Dr. Jackson with reference to how the institutions ought to be conducted that receive State aid. The statement that the institutions receiving State aid offer bribes is a severe reflection not only upon institutions that are doing a grand and noble work of charity throughout the whole Commonwealth, but it is also a reflection on the Committees of the Senate and House of Representatives, to say they receive bribes at the hands of these institutions. The members of the Pennsylvania Legislature are above such reproach.

DR. THOMAS S. K. MORTON said that he was connected with two hospitals that are accustomed to receive State aid and he knew all about the methods by which their appropriations are secured. He gave his word to the Society that they are obtained purely upon the merits of the institutions as shown to legislators by friends, patients and students; in these two instances no corruption has ever been employed or thought of.

The suggestions made in Dr. Jackson's paper are entirely too superficial to remedy the difficulties of which the medical profession is so painfully aware. His propositions appeal as mere pruning of branches, when the real difficulty is located in the roots of the great tree of monopoly of natural advantages; or as

plasters for sores instead of reaching the disease affecting the whole body. The real trouble originates in the fact that the hosts of patients applying to charities cannot secure access to opportunities; nor when they get work do they receive their due share of the product. When that defect in the distribution of wealth shall be discovered which thus appears destined, unless remedied, to wreck our civilization and carry us back to barbarism, then also will the charity question and the question of the actual existence of the physician be also solved. Of most charity Dr. Morton felt pessimistic, believing that when wage-workers are given medical advice or other form of alms it simply enables such as receive it to compete more fiercely with those who are attempting to lead a more self-respecting life. This competition, bred in part by charity, tends to lower all wages, and in the end perhaps the mass of people are not only no better off for its bestowal, but may actually, through loss of pride and self-respect, be in infinitely worse condition.

So far as Dr. Morton could see, the future of medicine will develop great incorporated hospital companies. These will be organized as pure business ventures, will erect splendid buildings, equip them perfectly, pay large salaries to the very best medical men that can be secured to conduct the scientific portion of the work, and will use the ordinary mercantile methods of securing business. Already such enterprises have made their appearance and have proved exceedingly profitable to their owners in certain portions of the West, and there is every reason why they should be successful when so conducted. They do not operate, however, to the best interests of the profession at large. Unless the profession can unite in the strictest kind of trades-unionism, escape from being rendered poverty-stricken, as a class, within the next generation, if present conditions continue, appears impossible.

If, on the other hand, the profession can apply a method by which the speculative and monopolistic value of natural opportunities and public franchises can be taxed back into the public treasuries, thus rendering accessible work for all and securing to the worker the full product of his untrammelled industry, all should be able to adequately recompense the physician for his services. Or, should great public hospitals assume the care of the greater portion of the population, the surplus physicians would find in these freer opportunities a means of livelihood to which they could turn

rather than to barbarous competition with their brothers in the profession.

Dr. M. PRICE said that there are a great many kinds of immorality and there are a great many kinds of bribery. The principle, "I tickle you at the State's expense and you tickle me at the State's expense," although no money has passed, is just as corrupt as if it had.

The statement that the specialist has put his fees at a figure so high that patients cannot come to them expresses a great mistake, as universal experience proves. Patients are usually treated in accordance with their means. In many instances no fee at all is received, although the physician or surgeon may have incurred considerable expense in connection with his service.

Dr. JACKSON said in conclusion that he was quite conscious that the subject under consideration is a very large one and that it takes hold on other even larger subjects, so that the discussion of it might be interminable.

In reference to the competition of the young private physician with the hospital, it ought to be borne in mind when this is proposed as a remedy that it is a very one-sided competition. The Pennsylvania Hospital has a reputation of a hundred and fifty years and is spoken of every day in newspapers and remembered by thousands, but the young doctor may grow old and be forgotten long before he can be known, by even the inhabitants of his ward, or a small district in it. If hope must be based chiefly on free competition of private individuals with great public institutions, it can be very well seen that there is ground for pessimism.

Dr. Morton has referred to the growth of the large private hospitals, particularly in the West, and as was indicated in the paper, unless the medical profession can do something for itself, capitalists will step in and employ it, or employ any member of it they choose. Unless medical men can organize and work together they will be worked separately.

There is one point of too much practical importance to be forgotten, that is, with reference to the organization of a Hospital for Contagious Disease now pending. The County Medical Society should try to carry out its ideas in the organization of this institution. While no more additional hospitals than can be helped are wanted, the Society is committed to this one, and so should join in its organization to see that it shall be upon better lines than have been followed in organizing other hospitals.



RESECTION OF THE STERNUM FOR TUMORS, WITH THE REPORT  
OF TWO CASES AND A TABLE OF SEVENTEEN  
PREVIOUSLY REPORTED CASES.

W. W. KEEN, M.D., LL.D.,

[Read February 24, 1897.]

CASE I.—*Resection of the Manubrium, Inner Third of the Left Clavicle and Lower Third of the Left Sterno-Cleido-Mastoid for Sarcoma.* in diameter. This disappeared in about a week. A month later a similar spot appeared at a corresponding point on the left side. This swelling developed grad-



FIG. I.

Sarcoma of Manubrium, Left Clavicle and Sterno-cleido-mastoid.

Mrs. F. ———, twenty-eight years old, was admitted to Jefferson Medical College Hospital, November 18, 1895. About nine months before she had noticed a spot of tenderness at the right sterno-clavicular articulation, over an area about two inches usually into a moderate tumor, which became tender and occasionally painful. When the patient came under observation it covered the end of the clavicle and the upper left portion of the manubrium, and there were two small nodules

over the lower end of the sterno-cleido-mastoid. (Fig. I.)

A careful investigation of the woman's history led me to disbelieve that the swelling was possibly syphilitic. This view was further supported by the fact that before her entrance into the hospital a thorough

examination. This was the first point to determine. I therefore first made a semi-circular incision, beginning at the right sterno-cleido-mastoid insertion into the clavicle, arching up into the neck, and ending below the middle of the left clavicle. By blunt dissection I then freed

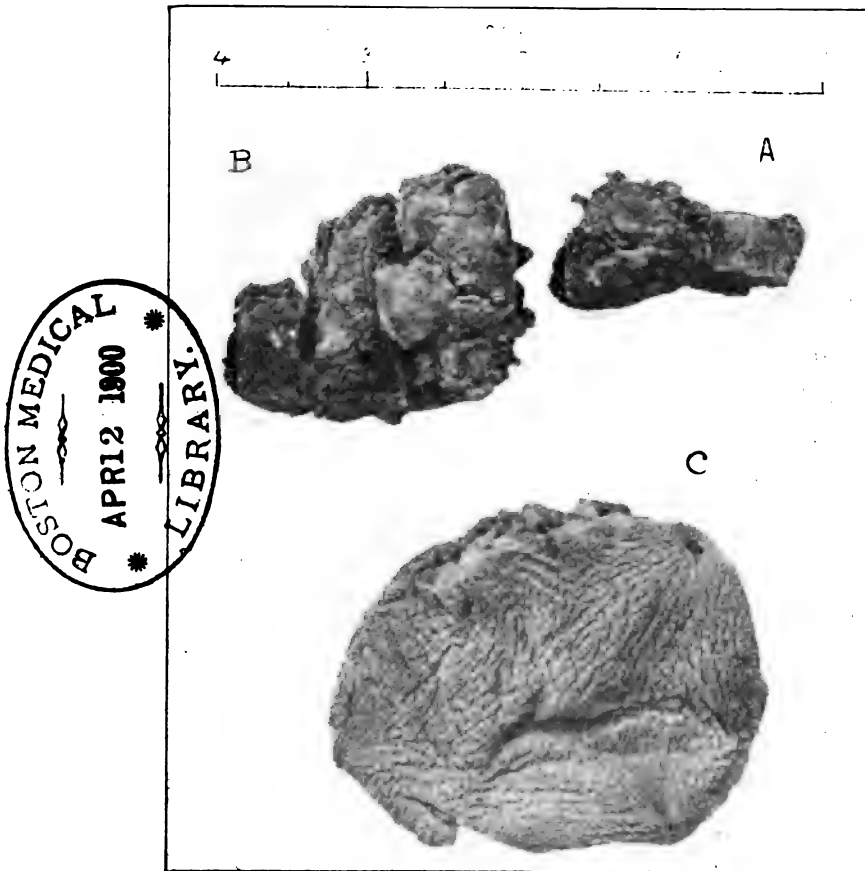


FIG. II.

The parts resected (except the first rib):—A. The Clavicle. B. The Manubrium. C. The Tumor in front of the Bones and the Sterno-cleido. (Four pins to hold it when photographed, looking like depressed nipples, are seen at the four corners.)

course of anti-syphilitic treatment had resulted in no improvement. The diagnosis, therefore, was made of a sarcoma.

*Operation, November 20, 1895.*—The only question in my mind was whether there were such adhesions behind the bone as to prevent the removal of the manu-

brium. The tissues at the inner border of the left sterno-mastoid, inserted my finger well behind this muscle, and worked my way downward behind the manubrium sufficiently to determine that there were no such adhesions as to prevent the resection that I contemplated. I then divided the sterno-mastoid at the junction of

its lower and middle thirds, and removed the lower third of the muscle, together with all the diseased tissues from in front of the sternum and clavicle. (Fig. IIc.) This laid bare the clavicle and the sternum, both of which I found were more or less worm-eaten by disease. Carefully loosening the tissues behind the clavicle, I then sawed this bone at the junction of its inner and middle thirds, and removed the inner third of the clavicle entire. (Fig. IIa.) I next separated the cartilage of the first rib from the parts behind it, and removed one inch of the inner end of the rib. The manubrium was then free, both above and to the left, and I was enabled gradually to insinuate my finger behind the manubrium, and separate it from the tissues of the mediastinum. A strong pair of bone-pliers was then passed behind the manubrium, and it was divided just to the left of its right border, and then horizontally just above the joint between the manubrium and the gladiolus, and removed. (Fig. IIb.) None of the vessels at the base of the neck was laid bare, excepting the left jugular, but the pulsation of the arch of the aorta was perfectly perceptible. Fig. III shows in a diagrammatic way the parts removed. A few small vessels were cut and tied. The skin was undermined, both above and below, and approximated as closely as possible, but a considerable gap was left in the center, between the two flaps. Moreover, the flaps did not rest on the soft parts behind them. In dressing the wound, therefore, I endeavored, by means of compresses and a bandage, to bring the surfaces in contact.

The patient stood the operation very well, but little blood being lost. The tension on the stitches was very great, so that in a few days they ulcerated through to a considerable degree, and caused both redness and suppuration. By the third day the temperature had risen to 102.5°. In the considerable cavity corresponding to the upper portion of the mediastinum pus accumulated, and there was much danger of its burrowing downward into the anterior mediastinum and, as I especially feared, towards the apex of the left lung.

Accordingly, I drained the cavity most satisfactorily by Cathcart's apparatus as modified by myself.<sup>1</sup> By the ninth day the temperature had fallen to the normal, and, with slight fluctuations within a very narrow range, remained at this point till

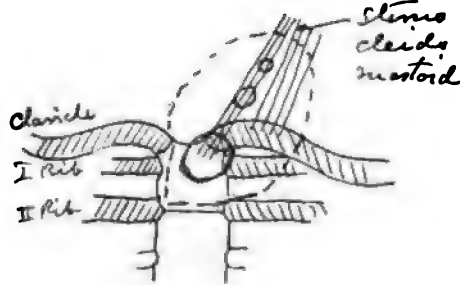


FIG. III.

Diagram of the Resection. All the parts within the interrupted line were resected. The three circles represent the sarcomatous nodules.

the patient was discharged January 26, 1896, with a small ulcer yet unhealed. Soon afterward the entire surface healed.

I have the pleasure of showing the patient to you to-night (Fig. IV). You will observe a slight tendency to keloid in the scar; otherwise there is nothing abnormal. The pulsation of the aorta and innominate can be both seen and felt. Her general health is excellent. No return has occurred after more than fifteen months.

The specimens were given to Dr. D. B. Kyle, who reported as follows:—"Sections of the tumor of the sterno-mastoid muscle showed, in certain areas, round-cell infiltration, with vessels showing embryonic walls. Certain areas showed adult fully developed structure, but there was sufficient characteristic structure to warrant the diagnosis of sarcoma. Sections of the rib showed round-cell infiltration, but not in itself characteristic of sarcoma. Sections of the manubrium were more marked, it being typical round-cell (small) sarcoma. Certain minute areas showed cystic degeneration."

CASE II.—*Carcinoma of the Breast; Secondary Carcinoma of the Sternum at the Junction of the Manubrium and the Glad-*

<sup>1</sup> *Annals of Surgery*, February, 1896.

*iolus. Successful Removal of Both Breasts; Resection of Parts of the Manubrium and Gladiolus; Recovery. Death from Recurrence.*

Mrs. B., 44 years old, was first seen with Dr. J. H. Beck, of Philadelphia, February 17, 1892. She had first noticed a tumor in the left breast during the preceding summer. This had given her only moderate pain, but it had grown of late

On January 19, 1894, the sternum showed a slight bulging at the junction of the manubrium and gladiolus. Whether this was a normal angulation which had escaped my notice, or an infection of the bone, I was uncertain.

On February 19, 1894, the thickening of the sternum had distinctly increased, and I also discovered a small nodule in the right breast at the inner border. No



FIG. IV.

The Present Appearance of the Patient. (Case I.)

rather rapidly. Examination showed a tumor two and a half inches in diameter in the upper outer quadrant, the nipple just beginning to retract. The axillary glands could be indistinctly felt.

*Operation, March 1, 1892.*—The breast and several enlarged axillary glands and the fascia over the pectoral muscles were removed. The muscles themselves did not seem to be involved and were left. The patient made a prompt recovery.

On May 20, 1893, a small nodule that had recurred in the scar was excised.

glands were appreciable in the right axilla.

*Second Operation, March 22, 1894.*—Within the preceding month the sternal tumor had increased very much in size, and the woman finally consented to an operation, which I performed at this time, with the assistance of Dr. J. William White. There being two small nodules in the skin over the sternal swelling, an elliptical incision was made, including both of these nodules. Four or five deeper nodules were then perceived which had not been noticed through the skin. As

the sternum and also the cartilages of the second and third ribs, as well as the intercostal muscle between them, seemed to be involved, I removed both the cartilages and also the intercostal tissues down to the pleura. The internal mammary artery was divided and secured by a curved needle passing through the thinned wall of the pleural cavity. A considerable portion (about  $1 \times 1\frac{1}{2}$  inches) of both the manubrium and the gladiolus was then removed by the double rongeur forceps until apparently healthy bone was reached. The right breast was then removed, together with a layer of the pectoral muscle and all of its fascia, and the right axilla cleaned out. At the end of the operation the woman was in a very precarious condition, but under stimulants and strychnin she revived. Her highest temperature only once exceeded  $101^{\circ}$ . During April her temperature again rose and remained for some time above and below  $100^{\circ}$ , but she finally made a good recovery. While I was away on my summer holiday I learned that the disease returned, and that she died in the following August.

Dr. Kyle made the following report on the specimen: "Sections showed all the tissue to be infiltrated (malignant). The periosteum was thickened and cancerous. Also there was a small piece of the intercostal tissue extending down to the pleura, which, while not so much thickened, showed evidence of malignancy. The section of the rib or cartilage showed infiltration only on the upper side, which extended to the inferior margin. The central portion showed no evidence of malignancy."

#### RESECTION OF THE STERNUM

for any cause, but especially for tumors, is rare. In 1859 Heyfelder<sup>2</sup> was able to collect only twenty-five cases of resection for all causes from the time of Galen downward, and even of these six were superficial resections; and Steinheil<sup>3</sup> states that, apart from the cases very briefly reported by Otis in the History of our

Civil War, there were only thirty-six authentic cases reported. Mynter later, in 1891,<sup>4</sup> was able to find only two cases of resection for tumors besides his own. From various sources I have been able to collect in all seventeen cases, to which I have added the two cases reported in this paper, making a total of nineteen cases of resection of the sternum for tumors. I have excluded the superficial resections for exostosis, etc.; such as Weinlechner reports,<sup>5</sup> in which a colloid sarcoma of the breast was removed, together with an ossifying enchondroma of the gladiolus, as only the superficial layers of the bone were resected. I have restricted myself to those cases in which the entire thickness of the bone was removed, in seventeen out of the nineteen cases for tumor of the sternum, and in two cases for the removal of retro-sternal fibroids.

More or less of the sternum has been removed for various purposes:

(1.) To obtain access to the great vessels in order to ligate them. Bardenheuer<sup>6</sup> has advocated resection of the manubrium in cases in which it is impossible to ligate the subclavian or the innominate artery or veins at the usual points. This seems, I confess, a very heroic procedure. I do not know of any recorded case in which it has been necessary.

(2.) For fractures, and especially gunshot fracture of the sternum. The most extensive statistics are those of Otis,<sup>7</sup> who records fifty-one cases, with a mortality of 18, or 35.3 per cent. He illustrates with an excellent chromo-lithograph<sup>8</sup> a frightful wound of the sternum from canister, from which the patient recovered and lived many years. Through the wound the pulsation of the aorta could be plainly perceived. Otis refers also<sup>9</sup> to the case of the son of the Viscount Montgomery, who was injured by a severe fall, and fractured the ribs on the left side. An immense abscess formed, and a

<sup>4</sup>Annals of Surgery, XIII, 966.

<sup>5</sup>Bericht der K. K. Kaiseranstalt Rudolph Stiftung, 1871, Wien, 1873, p. 24.

<sup>6</sup>Deutsche medicin. Wochenschr., 1885, II, 688.

<sup>7</sup>Medical and Surgical History of the War of the Rebellion, Surgical Volume, Part I, pp. 486 and 571.

<sup>8</sup>Op. Cit. Opposite page 486.

<sup>9</sup>Op. Cit., p. 571.

<sup>1</sup>Lehrbuch der Resektionen, p. 304.

<sup>2</sup>Centralblatt f. Chirurgie, May 25, 1889.

large part of the chest-wall sloughed, so that the heart itself was exposed. The case is the more memorable from the fact that the young man was shown to Charles II by Harvey, in order that the king could perceive the movements of the heart.

(3.) The sternum may be resected for caries as a result of tuberculous osteomyelitis, and occasionally, as in one of my own cases (not here reported), from typhoid osteomyelitis.

(4.) The sternum has been resected for tuberculous fungous inflammation of the articulation between the manubrium and the gladiolus. Yvert<sup>10</sup> reports one case and quotes a second.

(5.) It is sometimes necessary to resect the sternum on account of retro-sternal abscesses. These may arise in the neck, from the thyroid gland, laryngeal cartilages, etc., and work their way downward into the anterior mediastinum behind the sternum. Sometimes they originate in inflammation of the sterno-clavicular articulation, as pointed out by Bardenheuer, the abscess rupturing posteriorly toward the mediastinum instead of anteriorly. Occasionally such an abscess originates from tuberculous or other inflammation of the bone itself, producing an abscess of the anterior mediastinum.

(6.) The resection is necessitated by tumors. These may be either retro-sternal tumors, such as fibromata, dermoids, or other forms of tumor; or they may arise in the sternum itself or at the inner end of the clavicle, and later may invade the sternum.

The cause of tumors of the sternum is usually unascertainable. Sometimes they are due to violence, especially if they be sarcomatous, as in one instance (Case XIII) in which the growth arose, apparently, from the injury done by a companion seizing the elbows of the patient and quickly approximating them behind the back. In another case, not treated by operation, it was ascribed to a heavy weight that struck the bone; in a third (Case XVII), to injury from a broom-handle.

Such tumors may be either primary or,

occasionally, secondary. In the latter case, they are usually secondary to carcinoma of the breast. I have now examined a great many cases, with a view of determining whether Mr. Snow's assertion is correct, that in most cases of carcinoma of the breast the sternum is tender at the junction of the manubrium and gladiolus from carcinomatous invasion of the bone. I confess that I have only very rarely found the bone involved. The second case related in this paper is an instance of this. I have also seen this sign in one case of atrophic scirrhus, in which no operation was performed. Most cases of carcinoma of the breast, however, seem to be free from such invasion.

The varieties of the tumors are as follows:

Of various forms of sarcoma, . . .	9
Chondroma, . . . . .	2
Secondary carcinoma, gumma, fibroma, of each one, . . . . .	3
Retro-sternal fibroma requiring resection, . . . . .	2
Variety not stated, . . . . .	3
Total, . . . . .	19

Almost one-half, therefore, of such tumors are usually, as one would expect, sarcomata. Occasionally the tumor extends into the muscles, as in the first of my own cases, in which there were nodules in the sterno-cleido-mastoid, and also in Case XIII of the table, in which recurrent chondromata appeared in the great pectoral.

Fortunately, adhesions to the retro-sternal tissues, and especially to the pleura and the pericardium, do not take place until late. These tissues are usually pushed before the tumor, and the tumor, therefore, if the operation be not delayed too long, may be separated from them with ease. In three instances (Cases II, III, IV) the adhesions were so intimate that the pleura or the pericardium, or even all three, were unavoidably torn during the operation. The effect of such a tear is much slighter than one would suppose. Ordinarily, it is believed that the lung collapses. This is true, to some extent, but in the case already alluded to, in which I resected part of the sternum and some

<sup>10</sup> *Revue de Chirurgie*, 1893, XIII, p. 32.

ribs on account of typhoid osteomyelitis, I unavoidably tore a hole in the pleura, which, at the end of the operation, was as large as a silver dollar, and not the least collapse of the lung took place. It rose and fell with every respiration, protruding from the wound during inspiration and receding during expiration. In Koenig's remarkable case (No. II of the table), in which both pleuræ and the pericardium were torn, very little respiratory difficulty followed, and the only disturbance of function was a marked increase in the frequency of the pulse. Tearing is not, therefore, always the formidable accident that it has ordinarily been deemed.

The portions of the sternum involved by the tumor were as follows:

Manubrium, . . . . .	5 times
Gladiolus, . . . . .	9 times
Clavicle, including also the manubrium, . . . . .	1 times
Retro-sternal tumors, . . . . .	2 times

The portion involved in the resection was the manubrium, 14 times; the gladiolus, 12 times. The total (26) exceeds the number of cases (19), as in some of them the resection involved parts of both the manubrium and the gladiolus. No instance of tumor involving the ensiform cartilage was found, but Ashurst<sup>11</sup> refers to the two well-known cases of Linoli and Rinonapoli, as well as a third case of his own, in which the ensiform was removed on account of uncontrollable vomiting apparently due to backward pressure of this part of the bone.

Women seem to be more subject to the tumors under consideration than men, as there are ten women and five men mentioned in my table. In the other cases the sex was not given. Age seems to exert little, if any, influence, as

Of 20 years and under there were 2 cases	
from 21 to 30 . . . . .	4 "
" 31 to 40 . . . . .	1 "
" 41 to 50 . . . . .	3 "
over 50 . . . . .	2 "
Total . . . . .	12 "

the age not being given in the remaining cases (7).

As to symptoms, physical signs and diagnosis, little need be said, as the tumor is always evident. Usually there is but slight pain and slight tenderness, but little inconvenience from pressure, and the presence of the tumor seems to be the main diagnostic sign. The size will vary from small tumors, such as were present in both of my cases, to the size of a fetal head, or to one weighing twelve pounds, as in a case reported by Dudon, or the very large tumor of Weinlechner, a composite sternal and mammary tumor, which extended from the middle line to the axilla, and from the clavicle to the border of the ribs.

The prognosis, for immediate recovery at least, is good. In Heyfelder's twenty-five cases, none of which was operated on for tumors, only two died. In Otis' fifty-one cases, eighteen died. In the nineteen cases here reported, in the first case the final result was not stated; of the remaining eighteen, four died, a mortality of 22.2 per cent. This is the more remarkable in view of the extent of some of the operations, such as those of Koenig, Küster, Mynter, etc.

The chest necessarily becomes narrowed when any large portion of the sternum is resected, as is stated by Bardenheuer and Koenig, but this seems to result in relatively slight inconvenience, either as to respiration or from the loss of support of the arm. In my first case, in which one-third of the left clavicle and practically all of the manubrium were resected, the use of the left arm is quite as good as that of the right.

*Operative Technic.*—The only treatment for the tumors under consideration is removal. If they are benign it is well, if one can do so, to keep the periosteum, but in the majority of cases, and certainly in all malignant cases, the periosteum should be removed with the bone. Bardenheuer advocates, in certain cases, osteoplastic resection of the bone, and states that he has waited as long as eight days before replacing the temporarily displaced bone. Of course, this procedure would only be applicable to those cases in which either a retro-sternal tumor was removed, or a temporary resection would be resorted to in order to ligate the vessels.

<sup>11</sup> International Encyclopedia of Surgery, VII, 528

The best incision, when it is practicable, consists in making a flap. Instead of this, however, the incision may be a T, an L or an I incision, being necessarily varied according to the circumstances of each case. In a good many cases, as in both of my own, the skin and soft parts in front of the bone must be sacrificed, because they are involved in the disease. When it is possible, at the conclusion of the operation, it is best to close the opening, either by sliding the flaps or otherwise, but in many cases this will be impossible, and, as in my first case, the cavity must fill by granulation-tissue. In some cases, as in my first case, in order to get free access to the bones, it is better to remove entirely the soft parts, laying bare the bones before their resection. This facilitates their resection very greatly, by getting out of the way the mass of the tumor.

After the incision has been made, the next step is the removal of the inner end of one or of both clavicles. The amount of this bone to be removed will depend, of course, upon how much is involved in the disease. If the disease be sternal alone, usually only the inner third of the clavicle need be removed. The next step is the resection of the ribs and their cartilages as close to the sternum as the circumstances of the case will allow. This will be followed by the division of the intercostal muscles and other tissues, great care being taken not to open the pleura or the pericardium, or to wound the internal mammary artery. Roulliès has shown<sup>12</sup> that this artery runs at a distance from the edge of the sternum varying from five to sixteen millimeters; that its position is not alike on the two sides of the body in the same patient; and that the narrower the sternum the further away is the vessel. If wounded, it can be secured, as in my second case, with a ligature passed by a curved needle.

The sternum now being cut loose from the clavicle, and the cartilages of the ribs being divided, the sternum and the tumor are lifted by blunt hooks and separated from the retro-sternal tissues. This is best effected by blunt dis-

section, and in my first case I found that the finger was by far the best means by which this could be done. I was so fortunate as to be able to separate the manubrium from the tissues behind it, including the great vessels of the neck, without even seeing any of them except the left jugular vein in the neck. If adhesions exist between the pleura or the pericardium and the tumor great care must be taken to separate them without opening either of these cavities, if possible. As pointed out, especially by Kœnig and Küster, an assistant's finger should follow the fingers of the surgeon with a pledget of gauze, so as to be ready instantly to stop any opening in either of these membranes. In the case of typhoid osteomyelitis before referred to, I occluded the opening in the pleura by a pledget of iodoform-gauze, suturing the flap of skin over this and allowing it to remain *in situ* for three or four days.

In some instances instead of a resection of the bone in its entirety the maneuver adopted by Mynter is the best, namely, to trephine the sternum at a given point and then with the double rongeur forceps, gouge, chisel or bone-pliers to remove the diseased portion piecemeal. Sometimes the saw can be used to advantage. As pointed out, especially by Bardenheuer, in cases of retro-sternal abscess, simple trephining is of little value. Such an abscess is likely to be very extensive on account of its spreading in the loose tissues behind the sternum and it will need complete and thorough drainage. After trephining, therefore, a large portion of the bone should be removed by the rongeur, gouge or chisel. Indeed, Bardenheuer states that in four cases he removed all the manubrium and gladiolus, with the costal cartilages and the inner ends of both clavicles, and in each case obtained recovery.

Beside the dangers to the pleura, pericardium and the internal mammary arteries, the great vessels at the base of the neck and top of the chest are, of course, the principal and most threatening. That they can be avoided is shown by the fact that in only one case (VI in the table) was any one of them torn. In this case, the internal jugular being torn, Barden-

<sup>12</sup> Resection du Sternum, Thèse de Paris, 1888.



heuer tied the right innominate, subclavian, external and internal jugular veins, and the patient recovered. In addition to this, the remains of the thymus gland, and, as a distant but possible danger, the phrenic nerves should be remembered.

If the soft parts in front of the sternum have been resected, thus leaving a large, gaping wound, it is impossible after a certain time to avoid more or less suppuration from later infection during the gran-

ulating process. In my first case this was a very serious danger and the pus threatened to make widespread havoc behind the gladiolus, and I feared at one time would enter the left pleural cavity. I adopted, therefore, Cathcart's method of drainage, which answered admirably. The cavity was kept absolutely free from the accumulation of any fluid and a light packing of iodoform-gauze absorbed what little was left.

## RESECTION OF THE STERNUM FOR TUMORS.

NO.	REFERENCE.	SEX AND AGE.	NATURE OF TUMOR.	PARTS RESECTED.	COMPLICATIONS.	RESULT.	REMARKS.
1	Holden, British Med. J., 1878, II, 358.	F. 52	Sarcoma of gladiolus.	Imperfect removal of tumor only to posterior surface of the bone.			The more successful methods of modern surgery were hardly then in vogue.
2	König, Centralb. f. Chir., 1882, No. 42.	F. 30	Osteoid chondroma of gladiolus.	Part of manubrium, the gladiolus and the ribs from 2d downward.	Both pleurae and pericardium opened. Both internal mammaries tied.	Recovery. Died 2 years later from recurrence in lungs.	Only slight respiratory trouble; great frequency of pulse.
3	Küster, Berlin klin. Woch., 1883, 127.	M. 30	Gumma of gladiolus.	Right half gladiolus and 3d and 4th ribs.	Left pleura opened.	Recovery.	
4	Pfeiffer, Beitrag. z. Kenntn. d. Sternal Tumoren, Halle, 1884.	M. 45	Sarcoma of gladiolus.	Gladiolus and 2d, 3d and 4th ribs.	Right pleura opened and pericardium exposed.	Died on 6th day. Pericarditis, hemo-thorax and pleurisy. Fresh tubercles in lungs.	Other tumors found at autopsy in 4th rib, pubes, in aortic glands, liver and right kidney.
5	Bardenheuer, Deutsch. Med. Woch., 1885, XI, 688.	F. —	Fibroid of manubrium.	Manubrium, $\frac{2}{3}$ of clavicle, 2d and 3d ribs.		Recovery.	Tumor extended to larynx, gladiolus and both clavicles.
6	"	M. —	Sarcoma of clavicle	Manubrium, $\frac{2}{3}$ clavicle, 1st and 2d ribs.	Int. jugular torn; tied right innominate, subclavian, int. and ext. jugular veins.	"	
7	"	"	"	Manubrium.	"	"	No other details given.
8	"	"	"	"	"	Death.	"
9	"	"	"	"	"	"	"
10	"	F. —	Retrosternal fibroid.	Manubrium, part of gladiolus, 1st and 2d ribs, and inner end of clavicle.		Recovery.	
11	"	"	"	"	"	"	
12	Jaenel, Resectio Sterni, Inaug. Dissert. Erlangen, 1887.	F. 12	Sarcoma of manubrium.	Manubrium, 1st and 2d ribs.	Retro-sternal tissues involved, and cauterized with nitric acid and cautery.	"	No return after a year.
13	Dudon, JI. de Méd. de Bordeaux, June 1, 1890.	F. 28	Enchondroma of gladiolus.	Manubrium, part of gladiolus and 1st and 2d ribs.	Internal mammary exposed, but not injured; suppuration of wound.	"	Tumor first removed by operation 27 months before; three small nodules removed 8 months later from pectoral and sternocleido-mastoid; ascribed to injury from bringing elbows forcibly together behind her back.
14	Mezzoui (in Dudon's paper).	M. 55	Myxo-sarcoma of gladiolus.	Gladiolus, 2d, 3d and 4th ribs.	None.	Death on 5th day from pneumonia.	

## RESECTION OF THE STERNUM FOR TUMORS—CONTINUED.

No.	REFERENCE.	SEX AND NATURE OF TUMOR.	PARTS RESECTED.	COMPLICATIONS.	RESULT.	REMARKS.
15	Graves, Med. News, March 4, 1893, 241.	F. 44 Sarcoma of gladiolus.	3 x 3½ in. gladiolus and 2d to 5th ribs.	"	Recovery.	Right breast removed for carcinoma 22 months before.
16	Doyen, Arch. Prov. de Chir., 1895, IV, 633.	M. 37 Sarcoma of manubrium.	Manubrium, parts both clavicles and 1st rib.	"	"	Right and left brachiocephalic vein disclosed; lungs and heart seen, but neither pleura nor pericardium opened.
17	Mynter, Annals of Surgery, 1891, XIII, 96.	F. 20 Melano-sarcoma of gladiolus.	Gladiolus (6 sq. in.) from 3d nearly to 6th ribs, and 3d, 4th and 5th ribs.	"	"	Weight between half and three quarters. Removed also glands from both axillæ and subclavian glands. Pericardium exposed; ascribed to injury from handle of broom. Dr. Mynter kindly writes me that patient died in Ireland about a year later, probably from recurrence.
18	Keen, Present paper.	F. 28 Sarcoma of manubrium and sternocleido-mastoid.	Manubrium, ½ clavicle, 1st rib and ½ sternocleido-mastoid.	Suppuration of wound; drainage by Cathcart's method.	"	No recurrence after 15 months.
19	"	F. 44 Carcinoma of manubrium and gladiolus.	Part of the manubrium and the gladiolus and 2d and 3d ribs.	Carcinoma of both breasts.	"	Left breast removed March 1, 1891; recurrent nodule in scar May 20, 1893. Right breast and parts of sternum March 22, 1894. Recurrence and death August, 1894.

## A BRIEF OUTLINE OF THE THEORY OF THE MOVEMENT OF THE NEURON AS APPLIED TO NORMAL AND PATHOLOGIC MENTAL AND NERVOUS PROCESSES.

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[Read February 24, 1897.]

Subsequent to the reading of the interesting paper on The Neuron by Dr. A. O. J. Kelly,<sup>1</sup> a number of members of the Society requested me to give an explanation of the theory of the movement of the neuron as held by myself. As I have pointed out in a previous paper, the theory that the neuron is not an absolutely fixed morphologic integer has been advanced

independently by several writers. When the thought first occurred to me that nerve-cells have the property of movement, I examined the literature and found that it had already been announced independently by three writers, one in Germany and two in France. The first to advance such a view was Rabl-Rückard, who in 1890 suggested that nerve-cells have ameboid movement. At the same time he pointed out the significance of this view in enabling us to explain the phenomena of hys-

<sup>1</sup>Transactions Philadelphia County Medical Society, 1896, p. 215.

teria. His ideas, however, attracted no attention, but in 1894 L  pine, in relating a case of hysteria of peculiar form, advanced practically the same theory. His idea was that the neurons were capable of movement to such an extent as to enable them to alter the degree of their relation to each other. Some six months afterward another French writer, Mathias Duval, advanced the same theory in a communication made to the Soci  t   de Biologie. L  pine had been unaware of the view advanced by Rabi-R  ckard, and Mathias Duval was equally ignorant of that advanced by L  pine. A week after Duval had announced his theory, L  pine before the same society repeated his former arguments in its support. I myself presented the theory of the movement of the neuron in a paper read before the College of Physicians of Philadelphia, in January, 1896; and in June of that year read an address on the same subject before the American Neurological Association. In the meantime, in the spring of 1896, the theory had been again advanced by two other French physicians, Azoulay and Pupin.

This theory has now begun to attract general attention and is gradually meeting with support. It has been opposed, however, by the distinguished Spanish histologist, Ramon y Cajal. I will not take time to consider at length the views of this investigator, as I have already done so in a previous paper. I will, however, pause sufficiently long to point out that his argument bears within itself its own refutation. He maintains that nerve-cells do not move, but on the other hand that the neuroglia-cells move. He points out the fact that the processes of the neuroglia-cells have numerous short aborescent and plumed collaterals, and he states that in these cells two different phases can be observed: first, a stage of contraction, that is a stage in which the cell-processes become shortened; and secondly, a stage in which the cell is relaxed, that is a stage in which the processes of the neuroglia-cells are elongated. He maintains that the processes of the neuroglia-cells represent an insulating and non-conducting material

and that during the stage of relaxation these processes penetrate between the aborizations of the nerve-cells and their protoplasmic processes, and thus make difficult or impossible the passage of nerve-currents; on the other hand, in the stage of contraction the processes of the neuroglia-cells are retracted and they no longer separate the processes of the nerve-cells, and the latter are thus permitted to come into contact. Evidently Ramon y Cajal admits the very thing against which he contends, for if the nerve-cell processes are at one time not in contact and at another are in contact, they must certainly move, and the question before us is self-admitted. It matters not whether the processes of the nerve-cells move little or move much, but that they move at all is the question at issue, and this Ramon y Cajal admits, though he makes the movement a purely passive one. It is certainly a minor point whether the movement of the processes of the nerve-cell is active or passive; although it is in the highest degree improbable, and it is certainly not evident from the histologic facts at our disposal, that the neuroglia-corpuscles play the roll of an insulating material.

While the movements of nerve-cells have not been observed in vertebrate animals, such an observation has been made in an invertebrate form. A German investigator, Wiedersheim, in 1890 saw, in the living animal, *leptodora hyalina*, an entomostrakon, the nerve-cells in the esophageal ganglion move. This ganglion may in a sense be regarded as the brain of the animal, inasmuch as it receives the fibers of the optic nerve, and Wiedersheim actually saw these cells move and change their shape, and this movement he describes as slow and flowing. (He presents a number of drawings of the esophageal ganglion made at different times, showing the various shapes assumed by the nerve-cells.) This observation evidently possesses a profound significance. It does not matter that it was made upon a form far removed from the vertebrates, for we should remember that it is just in the lower forms that general biologic truths have been demonstrated. I will not occupy time

with a further consideration of the facts on which this theory rests, but will proceed at once to its application to normal and pathologic mental and nervous processes.

Before beginning a systematic consideration of the theory, it may be well to give as an illustration of its simplest expression the supposed behavior of the neurons in a case of transient hysterical paralysis. Hysterical paralysis, as we all know, may be so complete as to simulate very closely paralysis due to a gross lesion, and yet in the course of a few hours or perhaps in a few minutes such paralysis may absolutely disappear. Modern students of hysteria are convinced that hysteria is a *bona fide* affection, with a syndrome that is as characteristic as that of any of the diseases with which we are acquainted. The idea of voluntary simulation has no hold on the minds of neurologists to-day. What is it that happens in the nervous system when a limb, say an arm, is suddenly paralyzed, remains paralyzed for a time and again suddenly recovers its function? Evidently some change has taken place in the nervous system. Let us see how the theory of the mobility of the neuron enables us to explain the phenomena.

The neurons of the motor area of the cortex, as you are aware, present not only protoplasmic extensions directed towards the surface of the cortex, the dendrites, but also a protoplasmic extension downward, which becomes a nerve-fiber, but which is, properly speaking, a process of the cell-body, no matter what its length may be. This process, which is now known as an axon, extends downward through the white matter of the brain, the internal capsule, the crus, the pons, the medulla and the cord and terminates in the last in a brush-like extremity, the end-tuft. By means of this end-tuft the cortical cell is brought into relation with the motor nerve-cells in the spinal cord. What the relation between this end-tuft and the nerve-cell in the anterior horn of the spinal cord may be is not known. It is probably one of contact or of close proximity. That an actual continuity of structure between the

end-tuft and the spinal cell does not obtain is now absolutely known.

Now what happens in the case of hysteria in which the arm has been paralyzed? As the result, we will say, of an emotional or other psychic shock, or possibly of a physical shock, the neurons of the arm-center of the cortex retract their processes and in such a way that their end-tufts in the spinal cord no longer bear their normal relation to the spinal neurons. In other words, the connection between the cells is broken. We will suppose now, as many of us have seen, that as a result of suggestion, either with or without hypnosis, or spontaneously, the paralysis of the arm disappears. According to the view here advanced this disappearance is due to the extension or protraction of the processes previously retracted—that is, the end-tufts resume their normal relations with the spinal neurons and function is re-established. Certainly no other theory explains so readily the appearance and disappearance of hysterical paralysis or of hysterical anesthesia. In these conditions there is really a lesion, consisting of a break in the normal relations of the neurons, due to retraction of cell-processes.

As regards the movement of the cell-processes, it is highly probable that this property is not limited to the end-tufts of the axons, but that it is also shared by other processes of the nerve-cell, especially the collaterals, and perhaps even, to some extent, by the dendrites. A further possibility suggests itself, and that is, that the movement may be not simply one of retraction or protraction, but also lateral in direction.

Having acquired a clear conception of what is meant by the movement of nerve-cells, let us proceed to apply the theory in a systematic manner and let us see how readily it enables us to explain various normal and pathologic phenomena. Let us take, to begin with, the familiar instance of sleep. Sleep has been commonly attributed by physiologists to an anemia of the brain, notwithstanding the fact that true and undoubted anemia of the brain, such as follows great loss of blood, or accompa-

nies marked general anemia is not attended with somnolence, but rather with insomnia. Let us see how the movements of the neurons will account for sleep. Evidently the neurons, when functionally active, must be in relation with one another. Their processes must be either in contact or nearly so. Evidently this condition is a prerequisite of consciousness. Now what happens when the nerve-cells are exhausted by fatigue, when their volume and their cell-contents have been diminished, as we have every reason to infer is the case, from the experiments of Hodge? Evidently their processes become retracted and they are no longer in relation with one another. The neuron isolated from the rest by retraction must be without function. General retraction of neurons must mean absolute loss of function, must mean unconsciousness, must mean sleep. In other words, in sleep the neurons have their processes retracted; in consciousness their processes are extended.

See, also, how beautifully this theory enables us to explain pathologic unconsciousness, such, for instance, as attends cerebral concussion. A man, while conscious, receives a severe blow upon the head; the neurons suddenly retract their processes, and unconsciousness results. Certainly no other theory for the explanation of the unconsciousness of cerebral concussion is equally simple, or equally plausible. It is extremely probable also that other forms of unconsciousness are to be similarly explained; for instance, the unconsciousness of chloroform or ether anesthesia, or the sleep produced by drugs. In these conditions it would appear that the neurons, by virtue of the direct action of the substances introduced into the circulation, retract their processes, and, for the time being, sever their relations with one another.

Let us now turn our attention briefly to elementary normal psychic processes; let us take up, for instance, the physiology of perception. What are the changes that take place in the neurons when a thing is felt or seen? Let us take a simple illustration, such as I have used in a previous paper. Let us assume that a sequence of

sound-vibrations impinging upon the peripheral auditory neurons—that is, the nerve-cells of the spiral ganglion of the cochlea—produces in these neurons a change that affects the relations which their neuraxons—that is, their centripetal processes—bear to the nerve-cells of the auditory nuclei of the medulla, and secondarily to the neurons in the auditory area of the cortex. It is probable that the effect produced upon the latter is such as to cause them to retract, extend or otherwise move their processes, and thus bring about a change in the relations which the various neurons of the auditory area of the cortex bear to one another. It is evident, further, that the same sequence of sound-vibrations must always produce the same changes in the cortical neurons. In other words, given sounds are represented by certain combinations of the neurons with one another, and these combinations persist only so long as the vibrations impinge upon the auditory apparatus. An act of perception, therefore, consists of changes in the relations of the cortical neurons with one another; these changes corresponding to, and depending upon, certain physical impacts upon the sensory organs. As a corollary, the combinations among the neurons so formed bear definite and fixed relations to the external world.

Now what is the physiology of a conception? Evidently it consists in the re-forming among the neurons of an old combination—that is, a combination the same as, or similar to, what was originally produced by a physical impression upon the organs of sense, but which is now produced by some other agency. Thus, a given note produces a certain combination among the neurons in the auditory area, and the forming of this combination is an essential part of the act of perception. To my mind, the act of conception consists in the formation among the auditory neurons of the same combination, without the actual impinging of the sound-vibrations upon the ear. The explanation of the reproduction of old combinations in the cortex, without external sensory stimuli, I will, for a moment, defer, and pass to the consideration of memory.

Various theories have been advanced to explain the phenomena of memory, but I will not take time to consider them, simply showing how readily the theory of the mobility of the neuron explains this remarkable property of mind. Let us recur for a moment to the illustration just used. We will say that a sequence of sound-vibrations has impinged upon the peripheral auditory neurons, and, in turn, has caused the neurons of the auditory cortex to move their processes. Now, other things equal, the degree of the excitation depends upon the intensity of the physical impact upon the auditory apparatus. Evidently the number of auditory neurons aroused into action must vary greatly, and it is probable that the movement does not cease in the auditory area of the cortex, but is diffused among neighboring areas, and even among those which are relatively distant. Now, we will suppose that a sequence of sound-vibrations has caused the auditory neurons to assume new relations with one another. These new relations will depend largely upon the fact whether or not a similar sequence of impressions has passed through those neurons before. If so, the old combinations will be re-formed and, as a corollary, there follows the recognition by the *ego* of the sounds as something heard before. Here we have an elementary illustration of the act of memory. According to this view, memory does not depend upon fixed cerebral structure, but upon the combinations of the neurons formed from time to time being the same as, or similar to, those that have been formed before. Let me illustrate a little further: the excitation that has been produced in the auditory area of the cortex gradually diffuses in various directions—that is, there passes from the auditory center of the cortex, through the general cortex of the brain, a series of combinations among the neurons along the oldest and best traveled lines. At first a given sequence of musical sounds suggests merely a familiar air, but, a moment later, when the movement has diffused as far as the visual areas of the cortex, old combinations are re-formed, which now

give rise to visual memories, and, instead of merely the memory of a familiar air, we have in addition a visual memory of an instrument, or a person with whom the air is associated, or, perhaps, of an operatic performance. I might enlarge upon this theory of memory, but time will hardly permit. Let us bear clearly in mind, however, that memory is not due to any constant condition of structure, but merely to the forming anew of old combinations among the neurons.

Other psychic phenomena also find a ready explanation on the theory here advanced. We can readily understand, for instance, how sequence of thought is explained by the movements of the neurons. If the neurons are constantly changing, if from the hour of awakening they are constantly responding to stimuli from without by changes in their relation to one another, it follows that the sequence of thought itself depends upon the sequence of these changes. Herein lies, also, the explanation of the continuity of thought. The direction of thought, and the association of ideas, must depend largely upon the frequency, and the consequent readiness with which special combinations among the neurons have been and are formed. Another idea also suggested in this connection is that not all of the neurons are active at the same time, but that the number varies greatly. However, I shall not pause to further consider this aspect of the subject.

I shall now call your attention briefly to the application of this theory to various pathologic conditions. Let us take up some of the simplest phenomena observed in insanity. What is an hallucination? An hallucination I would define as the spontaneous formation of an old combination amongst the neurons representing a former perception or conception, as the result of pathologic conditions, and not in response to normal stimuli either from without, such as physical impacts upon the sensory organs, or in response to normal stimuli from within, such as preceding and connected trains of thought, or other normal psychic processes. The combination representing an hallucination re-

acts in such a manner upon the general neurons of the cortex as to give rise to the belief in the reality of the sound, vision or other special-sense manifestations.

What is an illusion? An illusion is such a faulty combination of the neurons among each other as to lead to an imperfect recognition by the *ego* of the object perceived. Take, for instance, a case in which a cord or rope is mistaken for a snake. Here we have physical impacts normally received by the sensory apparatus, but, owing to a diseased condition of the neurons, these impacts lead to incomplete and erroneous combinations. We have already learned from the investigations of Berkeley, Andriezen and others that the neurons, as a result of the action of various toxins, such, for instance, as alcohol, may become diseased, and especially their processes. There would, therefore, seem to be every justification for regarding illusions as dependent upon faulty combinations among the neurons.

What is the pathology of a delusion? Here again it is probable that the explanation is to be sought in disease of the structure of the neuron, and especially of its processes. It is characteristic of a delusion that the patient is incapable of accepting evidence in relation to his false belief, even when that evidence is properly presented. It would seem that in the case of a delusion it is impossible for the neurons to form such combinations with each other as will bring the patient into proper relations with the outer world. A simple illustration will make my meaning clear. The man who believes, for instance, that he has no mouth, in spite of the most direct physical evidence to the contrary, presents an instance in which a lesion has taken place among the neurons which renders them incapable of forming normal combinations in response to physical impacts upon the sensory organs. Again, it may be that a correct combination representing a perception or a conception is formed, but in such case the neurons of adjoining areas are defective, in that they cannot bring this combination into normal relation with the general neurons of the cortex.

How can we explain such a symptom as

delirium, or the mental condition seen in confusional insanity? Evidently, owing to disease of the neurons, the disease being transient and due to the presence of toxic products in the case of delirium, or being possibly structural in the case of confusional insanity, the neurons act irregularly and wildly, making constantly the most erroneous combinations with one another. Fully formed and partially or erroneously formed combinations rapidly succeed one another; probably also without relation to previously established lines of diffusion. It is easy also to explain the expansive mental state of mania and the depressive state of melancholia by merely supposing in mania that as a result of pathologic causes, generally toxic disturbances of nutrition, the neurons are acting with excessive rapidity and that a greater number of them are active than under normal conditions; and in melancholia that the movements are restricted and slower, and that a smaller number of neurons are active.

I had intended also to show the application of this theory to such pathologic conditions of the nervous system as are seen in hysteria and hypnotism. I have already instanced its application to one phase of hysteria, namely, hysterical paralysis. Let it suffice to say that all of the symptoms presented by hysteria, even the convulsions, can be explained by it. I will not, however, more than allude to this portion of the subject. To hypnotism, however, I will devote a few words, inasmuch as the theory of the mobility of the neuron is the only one that affords a rational explanation of this phenomenon. Let us recall to our minds for a moment the condition of the neurons during sleep: their processes are retracted. Hypnotism is partial sleep—that is, a state in which only a portion of the neurons have their processes retracted. Let me illustrate my meaning a little more in detail. Let us take a case in which hypnosis is induced by the ordinary method of staring fixedly at an object and in which at the same time the suggestion of sleep is made verbally by the operator. Now, by reason of the effort of the attention, expended through both the visual and auditory channels, the neurons

of the corresponding regions in the cortex are thrown into certain relations with one another, relations that correspond first to the action upon the ocular apparatus, and, secondly, to the words of the operator received through the auditory channels. Very soon, by reason of the visual fatigue and under the auditory suggestion of sleep, the neurons of the visual area retract their processes and the partial sleep of hypnosis begins. Gradually the sleep grows deeper—that is, by reason of the same influence, the other neurons of the cortex gradually retract their processes, with the single exception of those by means of which the verbal suggestion of sleep has been received, namely, the auditory channels. In other words, the consciousness of the individual has been restricted to the narrow field of auditory perceptions. While in this condition, somnambulism is readily induced. In response to words from the experimenter certain movements are induced among the neurons in the auditory cortex, and these movements, being communicated gradually

to the neurons of other areas of the cortex, for instance the motor area, may lead the individual to perform certain automatic acts or manifest signs of cerebral activity referable to other portions of the cortex.

I might still further elaborate this most interesting subject, but I must content myself by merely indicating the method by means of which hypnotism is to be explained. To my mind the theory here advanced is the only one that satisfies the facts.

I have endeavored to present in this paper my own views as to the application of the theory of the movement of the neuron and in as condensed a manner as possible. Any one of the special applications I have indicated could be enormously expanded. My desire, however, was to present this evening an outline merely of the subject, and I think that all will agree with me that the theory of the movement of the neuron is not only plausible, but captivating in the extreme, as it makes clear and comprehensible much that otherwise cannot be understood at all.

## DISCUSSION.

DR. S. SOLIS-COHEN considered the theory advanced much more than plausible; it should be termed possible or even probable. For the present it must, however, be regarded rather in the light of a good working hypothesis than as a demonstrated explanation of nervous mechanism. How well it throws light on common mental processes may be seen if one considers his own gropings after the name to be associated with a face that has been recognized—one is almost conscious of the sweep of the processes of the neuron hither, thither, just as one gropes his way in the dark with outstretched moving hands, until the proper connection is made, when, at once, the act of recollection is completed by a definite, satisfying memory; the combination sought has been established and the mind realizes its perfection.

So, too, lecturers seeking the appropriate word, or illustration, or technical term or statistic datum, must be conscious of a process that Dr. Dercum's theory permits one to satisfactorily picture. Again, when one is speaking or writing, words, facts, illustrations at times come slowly and must be sought, caught, dragged into consciousness; at other times ideas and phases come crowding upon one

another and the store of illustrations seems inexhaustible; one has a consciousness of force and swing and fullness in his words. How easy it is to picture on the one hand exhausted neurons feebly moving their processes and making few and poor combinations, on the other hand vigorous, active neurons reaching out to each other, forming rich and numerous combinations.

Dr. Dercum's explanation of sleep might be extended to some profound problems of psychology. Not alone consciousness, but all existence, is a question of relations. If that which is called *ego* cannot be brought in communicative relation with the external world, that world has for the *ego* no existence. If it cannot be brought into relations of communication with different domains of the subjective world, to which one is more likely to refer its activity, those domains have no existence for it—there is a contradiction in the very terms. The neurons establish relations of communication in waking hours—of non-communication in sleeping hours. In dreamless sleep communications of the *ego* with the subjective or external world cease—the very relations that give rise to the idea of the *ego* itself are not formed—conscious



existence is for the time suspended. It would be interesting to hear Dr. Dercum's explanation of dreams; though doubtless it would follow the suggestions of his remarks as to hypnosis, somnambulism, and the like.

The field is a vast one, but Dr. Dercum's hypothesis makes it possible, at least, to survey it better than it has hitherto been done.

DR. EDWARD JACKSON said that the test of a theory is, how it fits the known facts that it could be expected to have any relation with. One series of facts occurred to Dr. Jackson that seems to fit very well: Ophthalmologists apply certain tests for simulated blindness, as covering the eye that is claimed to be the seeing eye with a lens that, unknown to the person tested, prevents him from seeing with that eye, and he reads letters with the other eye, clearly revealing that he has only pretended blindness. Then there are other cases clearly of the nature of hysterical blindness, that seem to give the same results with these same tests. The patient claims to be blind in one eye, yet, tested in this way, when she believes that she is seeing with the other she reads with the eye that is claimed to be blind. The blindness in these cases is just as genuine as any other manifestation of hysteria. Then there are some cases that seem to carry the matter a step further. Dr. Harlan has reported the case of a man who had an eye injured many years before; and this eye, he had ever since believed, was completely blind. The man came for some irritation or trouble with his other eye, which he had been told, was due to the presence of this blind eye, and he was prepared to have the blind eye removed if that was deemed necessary in order to save the sight of the other. It showed no reason for the blindness. Dr. Harlan tried some of these tests, as that with the convex lens, which was devised by him. He found that the eye that was supposed to be blind had very good sight; and he was readily able to convince the patient that he had good sight in that eye, and the man went away rejoicing that he had two eyes when he thought he only had one.

In the last number of the *American Journal of Medical Sciences*, Dr. Prince, of Boston, records an interesting case. A man was tested, and on covering either eye, the other one showed very imperfect sight. His vision was very greatly impaired, and more on covering one eye than the other. But on allowing him to look with both eyes he saw perfectly. There are many cases of this kind on record in which the patient has had some reason for exaggerating the disability. But this man was seeking a position on the Boston police force, and had been rejected because of his apparently poor vision, the eyes having been tested separately. He had, by this experience, become conscious of the conditions under which he saw poorly.

The physiologic suppression of the sight of one eye is a common experience in the exclusion of one eye, although kept open, in using

the microscope. At first, for most persons this is difficult, but experience makes it easy to use it with both eyes open later on. In using the ophthalmoscope the oculist has still more practice in the same thing; all who use the ophthalmoscope usually keep both eyes open, yet they come to have little trouble in ignoring the image formed in the other eye.

All of these facts seem to be closely related; and they seem to be pretty well explained by Dr. Dercum's theory of the mobility of the neuron, which excludes one eye from acts of vision by the cutting off of connections. At times this is entirely under the domain of the will, or is readily influenced by the will; and at times the loss of connection is entirely independent of the will, or possibly independent of any stimulus that can ordinarily be applied to the nervous system. However the facts may be as to the actual movement of the processes, the theory makes a diagram on which knowledge can be arranged that is extremely suggestive.

DR. A. O. J. KELLY said that the theory of the mobility of the neuron, being both new and purely suppositional, is to be accepted with great reservation. Attempting to explain the mental processes of perception, conception and memory upon their supposed dependence upon movements of the neuron, it is of necessity to be inferred that these movements are more or less under the domination of the will. Being, however, personally unacquainted with the histologic basis of the will, Dr. Kelly was interested to know in what manner the will influences the neurons so as to cause them to move. The theory is, nevertheless, most captivating and ingenious, and, offered as it has been by Dr. Dercum in explanation of many normal and pathologic mental and nervous processes, it is entitled to the consideration that is accorded any theory that explains what others fail to. It is thus with essential paroxysmal tachycardia, as Dr. Kelly has lately pointed out.

DR. A. A. ESHNER said that the theory of the mobility of the neuron is a natural and a very happy outcome of recent developments in the histology of the nervous system. As has been stated, the theory is of almost unlimited application, if one chooses to view it in its various aspects. It throws light, among other things, upon the very considerable group of disorders at present designated functional and idiopathic. Qualifications like these are simply delusive cloaks for ignorance, and are calculated to hinder rather than advance true scientific progress. According to the theory so ably expounded by Dr. Dercum, it can be readily understood how nutritional alterations, incapable of demonstration, may give rise to derangement of function, and, if long maintained, even to structural lesions. Every act of life, during both waking and sleeping hours, is necessarily attended with changes in the nutrition of the nervous system, in the metabolic activity of all its cells,

as well, of course, as in the cells of all the organs throughout the body, and this in turn is bound to exercise an immeasurable influence upon function of all kind. So, too, as has been suggested with reference to the matter of narcosis, for instance from chloroform, or ether or other general anesthetic. The view has been propounded that the suspension of normal cellular irritability upon which depends the loss of consciousness that results from inhalation of an anesthetic is due to chemic or molecular changes that appear as phenomena of the process of coagulation.\* As in sleep, changes take place in the relation of cell-processes and cell-bodies, in consequence of which sensation is first lost, then perception and finally consciousness itself.

DR. JAY F. SCHAMBERG said that the very ingenious theory of the mobility of the neuron would, if viewed in the most comprehensive manner possible, explain almost the entire relation of mind to body and of body to mind. Dr. Dercum has mentioned the normal relation between the cells of the spinal cord and the terminal axons as being one, in all probability, of contact. He has referred to the suspension of this relation as a result of retraction of the axon that occurs in various pathologic conditions, such as hypnotism, hysteria, etc. There is a third possible relation to which he might have referred, viz.: A closer approximation than the normal. This would explain the pathologic intensifications of sensory and motor impulses, and also the hyperacuity of sense-perceptions, such as is often observed in hypnotism.

DR. F. X. DERCUM said that the explanation that suggests itself for dreams is that not all of the neurons are asleep; that, perhaps as a result of disturbed nutrition, or, possibly, of the

presence of toxic substances in the blood, some of them are active; but they can only form combinations along lines that have been traveled before. Combinations, no matter how grotesque the dream, are limited by the thoughts and experiences of the waking state.

In answer to the question as to the nature of the will, it may be said in the first place that a subdivision of the mind into the will, the intellect and the emotions, or, in fact, into any other parts, is not acceptable. The mind is an entity which cannot be sub-divided, save from the standpoint of the metaphysician. It is well known that many unicellular and simple multicellular organisms react as if they manifested some form of volition. If, in a sense, volition be a property of simple animal forms, it can be readily understood that a complex aggregate of cells should manifest the same property. The will may be conceived as simply a resultant of the interaction of all of the nerve-cells.

In regard to the suggestion that in hysterical spasm and hysterical catalepsy the nerve-cell processes are more closely approximated, Dr. Dercum fully concurred with regard to its probability, and in one or two previous communications on this subject, he has already suggested this idea. It is probable that hysterical hyperesthesia can be explained in the same manner. Hysterical pain, on the other hand, seems to be due to such a combination of the cortical neurons as will give rise to a cortical representation of pain; the pain is referred, as is well known, to a joint, a portion of the surface or some special structure. In other words, hysterical pain is a "pain hallucination." Dr. Dercum thoroughly concurred with the view in regard to the value of the theory here advanced in explaining many functional nervous diseases, and also with the interpretation of the phenomena described by Dr. Jackson.

Dr. G. Hudson Makuen exhibited

#### A CASE OF SPEECH DEFECT.

occurring in a boy fifteen years old, of good intelligence and well advanced in school, whose speech, in consequence of illness and want of training in early childhood, was so defective as to be quite unintelligible. After four weeks of training at the clinic for speech-defects of the Philadelphia Polyclinic, the boy became able to articulate distinctly quite a considerable number of short words, and Dr. Makuen expressed confidence, from the progress already made, that he would in a short time be able to speak as well as any one.

DR. S. SOLIS-COHEN asked if the boy's

parents were German, as for an American he spoke with a decided foreign accent. If not, the explanation must be sought in the fact that English, as spoken by others, is a foreign language to him. Dr. Cohen suggested that it would be interesting to compare the imperfect record of speech by phonograph at a later date with the progress made.

DR. G. HUDSON MAKUEN said that he had arranged to take a record of the boy's speech in a phonograph. This instrument is not altogether satisfactory, because, in order to get a clear reproduction, it is necessary to speak unnaturally loud, and the effort to do this oftentimes destroys the very peculiarity of speech that it is desired to record. The dialect is purely local, for the patient and his ancestors for two generations were born in Philadelphia.

\* *Medical News*, Jan. 14, 1893, p. 49.

A CASE OF SPLENO-MEDULLARY LEUKEMIA; ONE OF LYMPHATIC LEUKEMIA OR SPLENIC ANEMIA; FOUR CASES OF PERNICIOUS ANEMIA.

H. A. HARE, M. D.

[Read March 10, 1897.]

The cases that I desire to show to-night are three, and in addition I desire to speak of three others. Of these six cases, representing various types of blood-disorder, the first is an instance of undoubted spleno-medullary leukemia. In the second the diagnosis lies between splenic anemia and lymphatic leukemia. The other four are cases of pernicious anemia.

Case I. The first case that I show is that of D. B., 33 years old, an unmarried carpenter of Wilmington, Del., who came under treatment October 7, 1896. His family history is negative. Two brothers and three sisters are in good health.

The patient has worked in the Wilmington Car Shops as a carpenter for about 16 years and has never been seriously ill. He has never had chills, fever or sweats, although he has lived in a malarious district. He usually drank two or three glasses of whisky a day, and occasionally got drunk. There is no specific history. Five years ago he began to have indigestion, the result, as he supposed, of irregularity and haste in eating. He suffered from attacks attended with headache and vomiting, often accompanied by fever, and occurring at irregular intervals until the present trouble began. Five months ago he noticed a fullness of the abdomen, which he thinks has not increased in size since. He did not suffer from pain, but had a heavy dragging sensation in the epigastrium. He paid but little attention to his trouble and kept at work. About three months ago he was

conscious of a gradually increasing weakness, accompanied by considerable dyspnea. His family physician, Dr. Brown, of Wilmington, treated him for several weeks, and then brought him to the Jefferson Medical College Hospital.

On the day of his admission an examination of his abdomen revealed an immensely enlarged spleen extending considerably beyond the median line and to about three inches below the umbilicus. His general condition was good, and he had kept at work up to the date of his admission. His tongue was only slightly coated, the bowels were regular, and the appetite fair. His urine was acid in reaction, the specific gravity 1024, and it contained neither albumin nor sugar. Microscopic examination yielded negative results. On examination on October 16, the ocular media and the fundus were found normal; the field for form and color was normal, and the veins were large and tortuous. There was no evidence of hemorrhage.

The patient was given increasing doses of Fowler's solution of arsenic until, at the end of a month, he was taking eight drops three times a day. He also received a dram of fluid extract of ergot thrice daily. On November 16, on account of gastric irritability, fifteen drops of Fowler's solution were given again daily by the rectum, the ergot being continued by the mouth. The arsenic was gradually increased until forty-one drops were given twice daily, still by the rectum. On December 7, the solution was increased to forty-five drops a

day, in three doses, but on December 20, it was stopped on account of diarrhea. On the 21st, the patent was again given fifteen drops of the arsenic and a dram of ergot by the mouth daily, and these were continued until January 12, when I went on duty at the hospital. The administration of the ergot was then stopped, but the Fowler's solution was continued and was increased until the man was taking thirty-two drops daily. On the 20th, gastric disturbance again developed, and the arsenic was discontinued, but on February 2, it was resumed, but in smaller amounts. The examinations of the blood from the date of the man's admission to the present time having given the following interesting results:

Date.	Hemo- globin	Erythro- cytes.	Leuko- cytes.	Differential Count.
Sep 30, '96	28%	2,458,000	368,750	1 to 6. L 6 % M, 15%, P 60%, E 5%.
Oct. 2	25%	2,700,000	386,000	1 to 7.
" 16	28%	2,800,000	241,666	1 to 11.
" 26	40%	2,322,000	139,000	1 to 16 L 1%, M 28%, P 51%, E 4 My 3%
Nov. 8	45%	2,064,000	118,000	1 to 17.
" 20	50%	2,148,000	93,750	1 to 23.
Dec. 25	60%	3,600,000	217,190	1 to 17.
Jan. 9, '97	63%	4,000,000	60,000	1 to 68, L 4 %, My 4, P 67, E 10 M. 6.
Feb. 2	63%	4,000,000	19,000	1 to 210.
" 16	70%	4,100,000	80,000	

The letter L stands for lymphocytes, M for mononuclear leukocytes, P for polynuclear or polymorphous leukocytes, E, for eosinophiles, and My stands for myelocytes.

It will be seen, therefore, that at first the condition of the blood was bad, there being 368,750 white cells to 2,458,000 red. Megalocytes were present, and the lymphocytes were decreased in number. The number of polynuclear cells was about normal, and that of the mononuclear cells increased.

Physical examination of the patient on January 12, showed the spleen to be enlarged. At the present time it has decreased very much in size, and the man is almost well.

The second case presents a most interesting history. The patient was under my care for several months a year ago. At that time the splenic enlargement was very considerable, and there were areas in which

loud anemic murmurs were heard. The man's color was sallow, and his eyes had that peculiar fatty, yellow appearance seen in some cases of pernicious anemia. He was admitted to the Jefferson Medical College Hospital on January 9, 1897, with the following history:

Case II. J. P., aged 24 years, is an unmarried barber. Both parents are dead, the cause of death not being ascertainable. One brother died in infancy, and one sister six or seven years ago of pulmonary tuberculosis. Two sisters are alive and well. The patient stated that he had never been in the habit of taking whisky, and that he had smoked only in moderation. He had measles at seven years of age, and an attack of influenza seven years ago that confined him to bed for four weeks. During a portion of this time he was delirious. In 1894, he states that he had a severe attack of bilateral pneumonia, but completely recovered in five weeks. In November of the same year, while employed as a miner, he lost his balance at work and rolled for a distance of about thirty feet, sustaining considerable injury to the head and neck. He was unconscious when picked up, but reacted speedily, and two weeks later resumed work.

On October 8, 1895, he was admitted to the Jefferson Medical College Hospital, relating that his illness began in July, 1895, with moderately severe pain beneath the left clavicle. This persisted here for three days, and then descended to the left hypochondriac region and the pain became intense. A few days previous to the onset of pain, there had been noticed puffiness beneath the eyes and a decided swelling of the entire face. Profuse sweating occurred coincidentally with the pain, and the face became pale, and the pulse rapidly increased in frequency until it numbered 160 per minute. The respirations were embarrassed and the temperature was 100° F. There was complete loss of appetite and the bowels were constipated. The patient also states that he was unconscious for a period of three days. Loss of flesh and strength was marked, his weight diminishing from 130 to 116 lbs. He remained in bed for one month, and re-

gained his weight; but the pain, varying in intensity, continued in the region of the spleen. There was a sense of weight in this region which became more and more pronounced, particularly when the body was jarred.

When admitted to the hospital the most noticeable feature of the case was the extreme pallor of the face. The conjunctivæ were tinged with yellow, and the complexion was sallow. The lips, gums and tongue were bloodless. The tongue was clean, but flabby, the appetite fairly good, the bowels regular, the pulse 94, the respirations 22, and the temperature 102.4° F. Examination by palpation showed a large mass occupying the left hypochondriac region, and extending back into the lumbar region. Auscultation of the heart revealed an anemic murmur at the base. A venous hum was heard in the neck.

The urine was amber-colored, acid in reaction, and had a specific gravity of 1025. There was no albumin or sugar; urea was present in the proportion of four grains to the ounce. The microscope showed red blood-cells in abundance and a few granular leukocytes and epithelial cells.

On October 30, 1895, an ophthalmoscopic examination showed numerous hemorrhages throughout the retina of each eye. These were old and irregular in outline, and especially abundant near the discs. The veins were large and tortuous. On October 21 and 23, the patient had several slight attacks of epistaxis. He left the hospital on December 23, promising to return to the Out-Patient Medical Department to have his blood-counts made. On February 4, 1896, he returned, complaining of hematuria. He was slightly paler, but was in about the same condition as when he left the hospital. He now remained in the ward until July 6, 1896, when he was discharged, against the wishes of the physician in charge, but slightly improved; and went to work as a barber. He again returned to the hospital on January 9, 1897, and said that he had felt very well all summer until September, when he was put on very poor diet, consisting of tea, coffee, rye-bread and a little meat at noon. He gradually became

weaker until New Year's Day, but still kept at work, complaining of general weakness, headache when in the erect position, shortness of breath, and swelling of the feet and limbs, especially after standing. He was brought to the hospital in the ambulance.

On admission to the wards his temperature was 101° F., the pulse 130, and the respirations 24. On January 13, 1897, when I again went on duty, examination disclosed murmurs in the carotids. The anemic murmurs were not as marked as they were last year. The man had severe bronchitis, as a result of exposure. The degree of splenic enlargement was very considerable. On February 20 and 21 the patient had attacks of epistaxis. He was ordered fifteen grains of ferratin three times a day.

Examinations of the blood have given the following results:—

DATE.	HEMO- GLOBIN.	ERYTHRO- CYTES.	LEUKO- CYTES.
Oct. 9, '95	30%	2,060,000	8,000
" 12,	30%	1,792,000	5,000
" 15,	20%	1,400,000	9,000
" 17,	20%	1,400,000	9,000
" 21,	14%	1,100,000	6,000
" 25,	18%	1,000,000	7,000
Nov. 4,	23%	1,300,000	5,000
" 12,	25%	1,500,000	6,000
" 21,	30%	1,600,000	6,000
Dec. 7,	32%	1,800,000	7,000
" 25,	30%	1,950,000	5,000
Jan. 20, '96	30%	2,152,000	6,000
Feb. 12,	38%	2,545,000	8,000
" 29,	42%	2,580,000	7,000
Mar. 16,	35%	2,000,000	6,000
Apr. 1,	35%	2,180,000	5,000
" 23,	38%	2,000,000	5,000
" 29,	38%	1,992,000	6,000
Jan. 11, '97	30%	2,000,000	4,500
" 30,	48%	2,800,000	4,000
Feb. 5,	35%	2,500,000	5,000
" 16,	33%	2,024,800	6,200

[P8%, E3%,  
L84%, M4%.  
No alteration  
in the shape of  
the erythro-  
cytes.]

The large proportion of lymphocytes (84 per cent.) in this case would apparently make it an instance of that somewhat rare type of leukemia, called lymphatic leukemia, but there is an entire absence of enlargement of the lymph-glands and, what is more important, the increase in lymphocytes is purely relative, the total number of white cells being actually lower than normal. Aside from this state of the white blood-cells, the case

might well be classed as one of what has been called pure splenic anemia, or splenic pseudo-leukemia. Thus, we find, in the enlarged, and at times painful, spleen, the fact that the disease is commonly found at this patient's time of life and in his sex, and that the anemic fever has also been present. Further than this, in splenic anemia we often have a decrease in the number of red cells to one-half, with a similar falling-off in hemoglobin. Banti has regarded this state as a purely splenic form of pseudo-leukemia, or Hodgkin's disease.

The third case is one of true pernicious anemia, which may, perhaps, be placed among the few that have been reported as cured. The patient certainly shows a wonderful improvement, and one that is more marked than is usually met with in cases of this disease. He is before you, and you can at a glance perceive his ruddy hue. His history is as follows:

Case III. F. — R. —, aged thirty-nine years, an unmarried lumberman, born in Ireland, was admitted to the Jefferson Medical College Hospital on May 11, 1894. His parents died at an advanced age, the cause of death not being known to him. They had always been very healthy. The patient is one of nine children, and, so far as is known, all of his brothers and sisters have always been in good health. He has had some of the diseases of childhood, but later in life he was exceptionally strong and healthy, having suffered from no sickness of any kind until about the age of twenty, when, without cause, he had an attack of serous diarrhea, which lasted all summer. The diarrhea disappeared during the winter, but has recurred every summer since the first attack, with occasional outbreaks, however, also during the winter months. Fourteen years ago, he had croupous pneumonia. He was sick three weeks, and recovered completely. After this he had good health, excepting for the diarrhea mentioned, until April, 1893, when he began to have nausea, with occasional attacks of vomiting, irrespective of the taking of food. The vomited matter consisted usually of greenish mucus or fluid,

but was never large in amount. During the worst periods of the attacks he would vomit two or three times daily. His appetite was poor, and he noticed that his skin was quite yellow. The diarrhea and vomiting continued to get worse, and in May, 1893, he entered the Williamsport Hospital, where he remained four months under treatment for "some disease of the liver." After leaving the hospital he felt better, the vomiting and diarrhea having ceased, and he gained considerably in weight, but he remained very weak. He worked for a while driving a team, but this work soon became too hard for him; and in April the old trouble returned as before, and continued to grow steadily worse. He decided to come to Philadelphia for treatment, and was admitted to Jefferson Hospital on May 11, 1894.

On May 18, 1894, his condition was as follows: He presented a markedly anemic appearance, the skin having a slightly yellowish tinge. The lips and ears were almost bloodless, and the tongue pale, but clean. His appetite was fair and his bowels quite loose. He had been gradually losing weight. His temperature ranged from 99° to 101° F., the respirations from 24 to 30 and the pulse from 68 to 80.

An ophthalmic examination showed that his pupils responded to light and in accommodation. The conjunctivæ were infiltrated with lemon-yellow fat. There were numerous fresh and old hemorrhages into the retina. The discs were anemic, and the veins and arteries could scarcely be distinguished on account of the pallor of the blood. A chest-examination showed the skin to have a light-yellow tinge, with extreme pallor and superficial edema.

The respiratory movement was good and there was slightly increased vocal fremitus on the right side. Auscultation and percussion yielded negative results. The impulse of the heart could scarcely be felt. The apex-beat was normal in position, but it could only be determined by auscultation. There was no increase in the area of cardiac dulness. Auscultation revealed a soft systolic murmur, heard best at the base and at the second costal cartilage at the left of the sternum; it was

not well transmitted into the neck. The liver was normal in size and was not palpable. There was no increase in the area of splenic dullness. The abdominal examination was otherwise negative. The feet were slightly edematous. The urine was shown to be acid in reaction and light-yellow in color. It contained no albumin or sugar. The specific gravity was 1.014. Repeated examinations of the feces did not reveal the presence of parasites of any description. The sputum-examination was negative.

The blood-examinations gave the following results:

Date.	Hemo-globin	Erythro-cytes.	Leuko-cytes.	Vol. Prct.	
May 14, '94	15%	973,000	7,000	25	Microcytes. Macrocytes. Poikilocytes.
June 14, '94	10%	664,000	5,000	14	
July 9, "	50%	2,500,000	5,000	50	Almost all corpuscles are normal.
July 24, '94	55%	2,600,000	8,000	52	
Aug. 14, "	55%	2,650,000	9,275	53	
Sept. 12, "	60%	3,800,000	10,000	76	

The patient was discharged from the hospital September 13, 1894, very much improved in health, his symptoms having all disappeared. He then went to work in the pine forests of Bradford county, Pa., and his old trouble gradually returned. He was again admitted to the hospital August 28, 1896. He was now very weak and anemic, and had diarrhea and vomiting, with pain in the epigastrium. He also had considerable cough, with clear, frothy, expectoration. The urine was acid in reaction and had a specific gravity of 1.022. No albumin or sugar was present. The ophthalmic report on September 22, 1896, was as follows: Pupillary reaction, normal; conjunctivæ, pale; media, clear; nerve, white; veins, tortuous; retina, apparently normal in both eyes. Vision O. D. 6-9; O. S. 6-30. In the right eye no hemorrhages had occurred; the veins were full, and there was some chromatic disturbance. The left eye showed a round disc, and was very pale, with full veins, and a patch of choroiditis near the nasal side of the disc. Following is the record of the blood-count since the patient's last admission:

Date.	Hemo-globin.	Erythro-cytes.	Vol. Per cent.	Leukocytes.
Sept. 1, '96	35	1,180,000	23	5,000
" 7,	35	1,150,000	23	5,000
" 14,	26	1,109,000	23	4,000
" 21,	26	941,000	20	3,120
" 22,	23	886,000	20	3,800
" 23,	25	1,200,000	22	5,000
" 24,	28	1,045,000	21	3,125
" 28,	26	1,333,250	26	6,250
Oct. 8,	30	1,500,000	31	3,750
" 19,	36	1,233,000	26	9,275
" 29,	53	1,600,000	35	9,375
Nov. 17,	65	1,400,000	30	10,937
Dec. 4,	80	3,960,000	78	14,000
Jan. 5, '97	65	3,200,000	65	9,375
" 16,	60	3,080,000	62	9,375
Feb. 5,	85	4,000,000	80	24,000
" 18,	90	4,360,000		10,900

Under full doses of arsenic or iron sulphate the number of red blood-corpuscles has increased from 886,000, on September 22, to 4,360,000 on February 18.

CASE IV. The fourth case is also one of pernicious anemia, the patient being temporarily better, but not so markedly so. S. S. D., aged 61, consulted me January 30, 1895, stating that for two months he had not been feeling well. His stomach and bowels were out of order, his fingers and feet were cold, but he did not cough, there was no mucus in his stools, and his sleep was not disturbed. Examination of his urine gave negative results. The condition of general debility improved under treatment, and I did not see him again until the twenty-fifth of the following October, an interval of nearly nine months, when he came back complaining of slight debility. I saw him again on March 17, 1896, when he complained of gastric disturbance, for which I gave him condurango. I noticed that his face was a little drawn to the right side, and that he appeared to be markedly anemic, but he stated that he had always had a chalky color and was naturally pale. Ten days later he was somewhat better, and on June 25 he reported himself as being very much improved. I did not see him again until November 12, 1896, when he presented himself in a state of advanced anemia. There was a faint mitral systolic murmur, and some dyspnea on exertion, and his fingers were a little blue. The analysis of his urine was negative. Three

weeks later he came to my office again, complaining of very great shortness of breath, the dyspnea being so marked as to seriously incommode his movements. At this time an examination of his blood gave the following results: Hemoglobin, 30 per cent.; corpuscles, volume 25 per cent.; number, 1,332,000; leukocytes, 5,000; lymphocytes, 10 per cent.; mononuclear leukocytes, 30 per cent.; polynuclear leukocytes, 55 per cent.; eosinophiles, 5 per cent. The blood also showed marked poikilocytosis, and microcytes and macrocytes were present, the latter being very large. There were also numerous normoblasts and gigantoblasts. Microscopically the appearance of the blood was slightly paler than normal. It was quite thin and did not coagulate readily. The patient was immediately put upon iron peptomanganate and ascending doses of arsenic. Ten days later the dyspnea was still present, but sleep was better. I then ordered a wine-glassful of maltale twice a day. Examination of the blood at this time showed: hemoglobin 28 per cent.; red corpuscles, volume 30 per cent.; number, 1,060,000; white cells, 8,000; lymphocytes, 16 per cent.; mononuclear leukocytes, 25 per cent.; polynuclear leukocytes, 59 per cent.; eosinophiles, none. The difference in the count and in the results from the hematokrit seemed to be caused by the megalocytes; otherwise the condition of the blood was practically the same as at the previous examination in regard to poikilocytes, microcytes and megalocytes.

On January 23, the patient expressed himself as feeling much better, and he looked much better. At this time the hemoglobin was 35 per cent.; the red corpuscles, volume, 33 per cent.; number, 1,520,000; the white cells, 6,000; the lymphocytes, 16 per cent.; the mononuclear leukocytes, 32 per cent.; the polynuclear leukocytes, 52 per cent.; and there were no eosinophiles. There were only a few poikilocytes and megalocytes. It is noted that the blood showed a marked improvement over previous examinations.

On Jan. 6, 1897, the examination resulted as follows: Hemoglobin, 37 per cent.; red

cells, volume 42 per cent.; number, 2,212,000; leukocytes, 6,300; lymphocytes, 20 per cent.; mononuclear leukocytes, 16 per cent.; polynuclear leukocytes, 60 per cent.; eosinophiles, 4 per cent. Microscopic examination revealed a few microcytes and macrocytes and only an occasional poikilocyte.

On February 2, 1897, the man reported that he had gained eight pounds since December 16. The liver and spleen were still normal in size, the appetite was good and the bowels regular. He slept well, did not cough, and there was much less shortness of breath. He had taken the maltale regularly, but during his entire illness he had never been able to take more than six or eight drops of Fowler's solution of arsenic a day, with pepto-mangan, without developing gastric irritability. He has had massage twice a week for six weeks. An examination of his blood at this date showed: Hemoglobin, 45 per cent.; red cells, 2,400,000; volume, 46 per cent.; leukocytes, 10,000; lymphocytes, 5 per cent.; mononuclear leukocytes, 25 per cent.; neutrophile leukocytes, 70 per cent.; eosinophiles, 5 per cent. Microscopic examination shows a few poikilocytes and microcytes.

On February 24, 1897, the man reported that he was improving in every way. An examination of his blood gave the following results: Hemoglobin, 35 per cent.; erythrocytes, 2,250,000; leukocytes, 12,500. There were present a few microcytes, rather numerous macrocytes, and a considerable number of poikilocytes.

This case showed marked improvement on active hematic treatment. Whether or not the improvement will persist remains to be seen.

CASE V. The fifth case, also one of pernicious anemia, is that of F. L., a carpenter, aged forty-four years, born in Pennsylvania, and admitted to the Jefferson Medical College Hospital with the following history: His father had died of alcoholism; his mother had some nervous affection. His brothers and sisters were all living, and healthy, in his opinion, but cross-examination showed that one sister



was decidedly pale, and had white patches in the skin such as he had. The patient has had the ordinary diseases of childhood, and malarial fever eleven years ago, which lasted six months. Otherwise he has always been strong and healthy, until four years ago, when he began to suffer from weakness, but was not confined to bed. He has never lost flesh, does not cough or have sweats, and has no alcoholic or specific history. The appetite was good, the bowels slightly constipated. The urine had a specific gravity of 1018, was acid in reaction, and did not contain albumin or sugar. The blood-examination on March 15, 1895, showed the hemoglobin to be 17 per cent., and the number of red corpuscles 1,340,000, with slight poikilocytosis, and megalocytes and microcytes in considerable number. Only about 5 per cent. of the red corpuscles were normal. The white blood-corpuscles were normal, and there were no malarial organisms. Inspection showed a well-nourished man, intensely pale, the pallor being of rather a yellowish hue. The subcutaneous tissues were well-filled with fat. The heart and lungs were normal, except that the heart-sounds were feeble. The spleen was not enlarged, and the area of liver-dulness was normal. There was no abdominal disease, but deep palpation in the region of the head of the pancreas revealed the presence of a small swelling. The man was placed upon ascending doses of Fowler's solution of arsenic and reduced iron, given three times a day, the latter being given in ascending half-grain doses.

On March 26, 1895, the hemoglobin was 10 per cent., and the red blood-corpuscles numbered 760,000 to the cubic millimeter. On the 29th the hemoglobin was 10 per cent., and the red blood-corpuscles 548,000. On April 1 the hemoglobin was 8 per cent., the red blood-corpuscles 520,000. On April 5 the hemoglobin was 8 per cent., the red blood-corpuscles 454,000.

The patient died on April 6. The *post-mortem* examination showed well-marked *rigor mortis*, an abundance of subcutaneous fat, and the muscles well pre-

served and very red in color. The bone-marrow was chocolate-colored. There was a small, clear effusion in the right pleural cavity. The left pleura was universally adherent, and the cavity contained six ounces of clear fluid. The pericardium contained six ounces of clear fluid. The right ventricle was flabby and relaxed, while the left was firm and contracted. There were no clots in either ventricle or in the vena cava. A large chicken-fat clot was found in the pulmonary artery. The aortic orifice was patent; the mitral leaflets were slightly thickened. The cardiac muscle was pale, flabby, soft and cloudy. The pericardial fat showed a tendency to invade the heart-muscle. The aorta was pale and unusually soft and elastic, and was pared both longitudinally and transversely with little difficulty. The heart weighed fourteen ounces. The right lung showed extensive gelatinous edema. The peribronchial glands were pigmented, and a few of them were calcareous. The bronchi were normal.

The sixth case resulted in recovery, although it was apparently one of pernicious anemia.

CASE VI. J. D., aged forty-four, a coal-miner, was admitted to the Jefferson Medical College Hospital January 31, 1895. He related that his father had died of enteric fever. His mother was living and well. He had had the ordinary diseases of childhood, and had always been healthy until three years before, when he began to have a sensation of numbness in his fingers. Four months before he had noticed a similar numbness in the feet and legs, with a sensation of fulness in the stomach, and a chilly sensation in the lumbar region. He was markedly anemic. His urine had a specific gravity of 1020, and was acid in reaction; it contained no albumin or sugar.

On March 13, 1895, an examination of his blood showed poikilocytosis, the corpuscles varying very much in shape. There were numerous macrocytes and microcytes. There was a slight diminution in the number of white blood-corpuscles. The hemoglobin was 45 per cent., and the red blood-corpuscles numbered 2,500,000.

The patient was given ascending doses of Fowler's solution of arsenic, with half a grain of Quevenne's iron three times a day. On March 30 the hemoglobin was 58 per cent., and the red corpuscles 3,320,000, with very few poikilocytes. On April 12 the hemoglobin was 80 per cent., the red corpuscles 4,060,000. On April 23 the hemoglobin was 80 per cent., the red corpuscles 4,400,000. The hematokrit showed a volume of 94 per cent.

I have reported these cases because it seems to me that each of them possesses considerable clinical interest. The first case shows very great improvement, and a decrease in the number of white cells to a remarkable degree.

The second case, as already pointed out, shows a great increase in lymphocytes, yet no actual increase in white cells, in this respect resembling lymphatic leukemia, and yet not following its usual blood-count.

The third case is extremely interesting, as illustrating apparent cure of pernicious anemia. There is certainly great improvement, although clinical experience shows that a fatal relapse is to be expected.

The fourth case, also one of pernicious anemia, likewise shows very great improvement, sufficient to justify hopes of cure if it had not already come to a standstill, and we did not know the history of pernicious anemia so far as its progress is concerned.

The fifth case is an instance in which the disease pursued a rapid and fatal course, with very characteristic *ante-mortem* and *post-mortem* manifestations.

Finally, the sixth case illustrates how a patient, apparently in the early stages of pernicious anemia, can either be cured or have the disease arrested, although as it is a hospital case I cannot vouch for the permanence of the recovery.

## DISCUSSION.

DR. F. P. HENRY said that it is impossible to enter into details of the various kinds of leukocytes that are found in cases of leukemia, and which are only interesting to those who can see the beautiful granules of these corpuscles with the microscope. It is quite sufficient for the general practitioner to know, and this is about the only absolutely certain fact that has been demonstrated with regard to leukemia, that the difference between leukocytosis and leukemia is that in the former the increase affects only the polynuclear neutrophilic cells; so that in a case in which there is doubt and there is a great increase of white cells, that increase being limited to the polynuclear cells, it may be concluded with great certainty that the case is one of leukocytosis.

The second case exhibited by Dr. Hare is an interesting one. As long as the lymphocytes continue present in decidedly increased amount the case should be carefully watched. The condition of the blood, as regards the leukocytes is constantly abnormal. The tendency to relapse is very characteristic of all blood-affections, and in that respect there is a most striking resemblance between pernicious anemia and chlorosis, and this is not the only point of resemblance between these two conditions. Dr. Henry has often wondered what would become of the majority of cases of pro-

found chlorosis if they were left without treatment. Of course no one would be justified in performing such an experiment. Dr. Henry believes that they would degenerate into pernicious anemia. He has, in fact, seen this happen in more than one instance. Conversely, when pernicious anemia recovers, it goes through a stage that is characteristic of chlorosis, whether the patient be male or female. The blood will show first an increase in red cells; when they amount to 4,000,000 or 5,000,000 per cubic mm., there will be a small percentage of hemoglobin. The hemoglobin is made up slowly. As far as the blood-examination goes, at that time the case is one of chlorosis.

The hemorrhages in the second case were a very interesting feature. They are characteristic of cases of leukemia, and the practitioner who has a case in which there is epistaxis, persistent, difficult to control, or a case in which there are subcutaneous hemorrhages or hemorrhages from any mucous surface, should suspect, among other things, the possible presence of leukemia. There is one symptom that has been found present in a great many cases of pernicious anemia, a symptom dependent upon a lesion of the spine, which has been found *post mortem* in nearly every case that has been examined minutely in this city. Dr. Charles W. Burr has found in ten such cases degenera-

tion of the posterior columns of the spinal cord, which in life was indicated by an absence of knee-jerk. In all cases of extreme anemia, pernicious in type, Dr. Henry has found the knee-jerk absent on both sides and, coincidentally, the spinal cord was found degenerated in the posterior columns. Why the degeneration should affect the posterior columns alone is a question the answer to which might throw light upon the tendency of spinal disease to certain tracts. It looks as if the posterior parts were more sensitive to the impoverished state of the blood.

Good results were obtained in all of these cases by large doses of arsenic. Dr. Henry referred to a patient who at one time had a blood-count between 1,000,000 and 2,000,000 to the cubic millimeter, with the ghastly pallor of such a condition. He was apparently dying. The man slowly improved under this specific, arsenic, for it is entitled to be called such, and is now a perfectly well man. He has had many relapses, but he immediately resorts to his arsenic, to intestinal antiseptics of various kinds, among others bismuth preparations, and he recuperates. One is justified in calling such a case a cure. A person is cured of one attack of pneumonia, although he may ten years later die of another. Many other diseases besides pernicious anemia are characterized by a marked tendency to relapse. In the milder forms of anemia and in chlorosis, Dr. Henry has obtained the best results from the inorganic preparations of iron. He protested against the attempt that is being made by interested parties to persuade the profession that only the organic preparations of iron are absorbed. With regard to the absorption of inorganic iron the profession has for a long time been misled by the physiologic chemists, who, because they could not recover iron in the urine of an animal to whom it had been administered by the mouth, maintained that it was not absorbed. Another fact that confirmed them in this belief is that practically all the iron administered to a patient may be recovered in his feces. It was a long time before it occurred to the chemists that iron might be absorbed and excreted by the intestinal canal, which is undoubtedly the case. That iron does its work by entering the circulation is proved by the fact that chlorosis may be promptly cured by the hypodermic administration of iron. Dr. Henry emphasized the fact that, in common with many others, he has obtained the best results in the treatment of chlorosis from the inorganic preparations of iron.

Dr. Henry referred to two cases of pernicious anemia under observation at the Philadelphia Hospital, one of which has been treated by transfusion, because of the success reported from this measure by Dr. Brackenridge, of Edinburgh. The blood was kept fluid by mingling it with one-third of its bulk of a five per cent. solution of sodium phosphate. About six ounces of this solution were injected into

the veins of one of the patients. The immediate consequences of this proceeding were somewhat alarming. The patient had great dyspnea; epistaxis, from which he had previously suffered, returned slightly; his temperature rose, but his condition became fair, and he was certainly not injured by the procedure. However, the results from it have not been by any means as striking as have been reported by Brackenridge and Duncan, of Edinburgh.

Dr. H. A. HARE said that what he chiefly desired was an opinion from hematologists as to the diagnosis in the case of so-called lymphatic leukemia. The case appears to be a very curious one, and it is to be presumed that there was an agreement with the diagnosis.

Concerning the advisability of blood-transfusion, Dr. Hare held that this method will not stand examination when compared with physiologic results. He believed that Ponfick and Landois and a number of the other physiologists who have studied transfusion of blood to a great extent have come to the conclusion that blood-cells resident in one man's body die when they are transfused into another man's body, even if the blood is kept from coagulating by means of sodium phosphate. Therefore, the injection of blood that is prevented from coagulating by any substance does nothing more than add so much liquid to the blood-stream of the patient, and provides him with nothing better than an ordinary saline solution. In addition it gives his kidneys, spleen and other organs the further work of destroying red and white cells and eliminating their excreta from the body.

From a therapeutic point of view Dr. Hare said that those who have paid the most attention to this question, not only from the side of the clinician, but also from that of the pharmacologist, and notably Dr. Ralph Stockman, of Edinburgh, and a number of others, have come to the conclusion that in cases of anemia in which there is a decrease in the number of red blood-cells, in which each individual red cell contains more hemoglobin than normal, and of which pernicious anemia may be taken as a type, arsenic and mercury, in small doses, are the best remedies. These drugs act, perhaps, by increasing multiplication of cells throughout the body, including, of course, the blood-making organs.

On the other hand, in the anemias dependent chiefly upon lack of hemoglobin, as represented by chlorosis, in which the red cells are not decreased to a great extent, say 2,500,000, and there is only twenty-five per cent. of hemoglobin, great benefit is derived from various preparations of iron. Dr. Hare maintained that in many cases it is a mistake to administer as large doses of iron as are commonly given. It is a clinical and empiric rule that in chlorosis large doses of iron should be used. Why this should be is not known; different reasons have been advanced, but none is satisfactory. There are only about thirty grains of iron in the en-

tire human body, and if a man be given ten grains of iron three times a day, he receives just as much iron in a day as is in his whole body. In other words, the iron is poured in much faster than the system can utilize it. Recent studies made by German investigators have shown that when the quantity of iron in the food represents 0.40 and the excretions were analyzed, 0.39 passed out of the body every day. In other words, only 0.01 was retained.

Again, it has been found that when 0.40 of iron sulphate is given in addition to the 0.40 in the food 0.79 of the iron is eliminated. Of the forty extra units of iron given as a drug, all is eliminated, together with 0.39 of the units taken with the food. In other words, only a very minute part of the iron, either organic or

inorganic, taken is retained. These points seem positively proved and point to the fact that large doses of iron are contraindicated.

Dr. Hare approves clinically of reduced iron given in doses of one-tenth of a grain. This does not produce iron headache, while it permits patients with gouty and rheumatic tendencies to take iron, which otherwise they would not be able to take. Dr. Hare is inclined to attribute the benefits derived from the much-advertised preparations of iron, the albuminates, etc., very largely to the fact that they do not disorder the digestion, because they contain very little iron. On the other hand, the physician who orders the pharmacopoeial preparations of iron in the usual full doses gives in the course of twenty-four hours much more than the patient needs.

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## REPORT OF A MIXED GROUP OF ABDOMINAL SECTIONS, WITH A DISCUSSION OF METHODS.

JOSEPH PRICE, M.D.

[Read March 10, 1897.]

My object in reporting a group of consecutive operations is to demonstrate, first, that gynecologic operations should be done for disease only; second, that if our simple tested methods are followed faithfully, and operations are completed, the mortality can be made uniformly low; third, that operations should not be delayed by the general practitioner.

It is of interest as well as of value to note, in an introductory way, what has been done, how it has been done, and what have been the results. Very much that is done now in abdominal surgery would, not very many years ago, have been regarded as criminal interference, and would have subjected the surgeon to civil or criminal prosecution. Now *not* to interfere would be construed by the advanced men of the profession, if not by the law, as gross ignorance or criminal neglect. These embarrassments and risks were faced by our few heroic pioneers, who did more, in facing and battering down the enmities and prejudices of the great body of the

profession. The lines their hands drew we have followed, and have extended and broadened, but we have improved very little on what they did and the way in which they did it.

When we run our eyes along the lengthened and lengthening lines of surgical progress we feel a profound sense of gratification, of debt and gratitude to men of our own and other generations who have contributed to this progress. We have learned and unlearned much. We have very much yet to learn and to unlearn. Our differences are interesting and instructive. The sum of the results of earnest effort by the members of a profession marks the progress of that science. But some men have presented real achievements, to be refused recognition for ages, although we also know and regret that our attention is far too easily diverted from its necessary sober train by some enthusiast or speculator in some wondrous field of remedy. In no branch of human science or endeavor are these enthusiasts, these lineal

descendants of Plato, so numerous as in surgery. They would effect grand revolutions in a day. In illustration, we need only refer to Apostoli and his disciples. The electrolysis rage spread over two continents. Many educated and sincere men adopted this mode of treatment, and, sad to reflect, the sequelæ of the epidemic still linger with a few of the profession. For a time it was claimed that almost every known trouble could be cured by electrolysis: fibroids, extra-uterine pregnancy, retroversion and prolapse, and many other diseases. The mania had its day—it came and passed as those things do which are without rational basis, which cannot, do not, withstand practical, scientific tests. Comparatively few can now be found following Apostoli's methods. The majority of his disciples have laid aside the little machines in which they invested some of their surplus, and with which they toyed with the maladies of suffering women, aggravating troubles in many instances, or nursing delusions of relief and cure. This matter is more serious than we are disposed to consider it. Our voices are influential. Let us make sure of the value of what we do and the way in which we do it.

Treatment by electricity furnishes only one of many instances of particular remedies or surgical procedures that fall short of their early promise, that do not permanently relieve or cure. The very names of the originators sink into obscurity or have only the unenviable distinction of being associated with an historic failure. Such experiments have a serious side. Many are the victims of delusive forms of scientific zeal. It is the patient who suffers, and not the experimenter. While it must be acknowledged that very much of our knowledge and our ability to treat and relieve human suffering has been the result of experiment, the experiments have been along legitimate channels, and by methods that entail no mischief. The tests are scientific. The motive of the experimenter should always be a purely scientific one, without the taint of any desire to associate his name with something new, to be an originator. It is not a fact that names record discov-

eries. There are names associated with surgical appliances and procedures that were in use before the claimants were born. Our science and art are made up of myriads of contributions, and it would be difficult to tell from whom they emanated. Use popularizes a discovery. Everything scientific or otherwise is tested by its utility, its facility of practical and successful use.

Generally, our departure from simple, easy, scientific and common-sense methods results in mischief. The varied and complex conditions with which we have to deal do not call so much for surgical genius as for surgical common sense. Skill and success in doing comes of doing. In surgery it is not safe to assume advanced theoretic positions on the mere faith that they will afterwards be confirmed. Such theories often lead to dangerous experimentation with human life.

In all surgical troubles, those that commonly possess minutiae or detail should receive the closest attention. Little things become agencies working good or evil. Size often is given undue importance, while not infrequently it bears small relation to the seriousness of the trouble. The very minute may be the very dangerous. There should be special study of the pathology of intraperitoneal and pelvic disease, with a long apprenticeship in dispensary service. When opportunities exist for careful study in the diagnosis of pelvic troubles, such diagnostic skill should always be attained before there is any attempt made in the surgical treatment of abdominal troubles.

In presenting a mixed group of operations, selecting from a series each of a hundred, about every known and established procedure was called into practice. At the present time, sections for suppurating forms of disease are most common, in excess of all others; fibroids and cystomata follow, and following in very close order come tubal pregnancy and appendicitis.

Surgeons are largely influenced in their methods of operation by their fancy and their ability to apply and perfect them. They resort to those in which they are the most deft in use, which bring them the

best results. Many procedures have had a short life; for instance, the tying of the broad ligaments and their vessels.

In surgery, as in other things, we coin from our experiences our best lessons. My earlier experiences and my later ones have confirmed in me my conviction of the importance of drainage. It has had its advocates, and those denying its value, those indifferent to its use; and not a small number claimed that its use was evidence of imperfect, incomplete or bad surgery. Just now it would seem that all are drifting to its use. Those who were loudest in their condemnation of drainage are now loudest in its advocacy. Nothing so quickly drives men to the use of an expedient as failure without it. A few or many deaths set men down to sober reasoning; if not, patients and their friends will do the reasoning for them.

It has been claimed that drainage is not necessary in "ordinary" cases, owing to the absorbent power of the peritoneum to remove secretions. It requires more prescience than any of us possess to decide in many cases that the peritoneum will rid its cavity of the exuded fluids from broken-up adhesions. If the tube has no injurious effect, it is better to use it in every case than to risk non-absorption in a single case, which may have been thought to be "ordinary," but which has turned out the reverse. The question resolves itself into distinct propositions: First—Is there any danger from the retention of fluids in the peritoneal cavity? Second—Is the use of the drainage-tube a safe means of obviating these dangers? If the tube involves in its use an element of danger, what are the comparative dangers from its employment or its omission? That the peritoneum will, in many cases, relieve itself of exuded fluids, may be accepted as true. Experience has also shown that when it refuses to do so unaided, the free use of salines often assists it, and cuts short an acute attack of peritonitis. Experience has also shown that this mode of treatment often fails, necessitating the re-opening of the abdomen, thorough irrigation and the secondary use

of a drainage-tube, even though no pus has been discovered on the re-opening.

The fallacy in supposing an operation simple because no great adhesions have been involved, lies in the fact that great secretion can arise from a small adhesion, and that exudation of blood, which seems nothing at the close of the operation, may, when the patient rallies from the shock of the ether and of the operation, become very considerable. Does the use of the tube involve a question of danger? My answer is, were half the care used to keep the tube carefully cleaned, and to protect it from external contamination that characterizes the Gatling-gun warfare against germs supposed to enter through it, there would be little cause to fear it. If the tube is kept clean, if it is emptied often, it should be removed by degrees, commencing as soon as the discharge seems to be at a minimum, and in most cases no more irritation will be caused by it, or with it, than some inadvertence will explain. When an entire pelvis can be packed with lint to subdue hemorrhage, is it possible that a simple glass tube can cause such trouble as is frequently attributed to it? As to the use of the tube, my own experience teaches me that when kept clean, by frequently changing the cotton, and with careful attention to that part of the incision through which the tube is introduced, there is not the slightest danger of septic infection from its use.

This conclusion is reached after its application in extreme cases of pelvic adhesion, extra-uterine pregnancy, hysterectomy, pus-tubes, and (so-called) simple operations. I have never had a single case in which I could justly attribute unfavorable results to the use of the tube. On the contrary, I have seen more than one case in which its absence has been followed by mischief, which was relieved by its introduction. I have seen cases, too, in which I believe failure was due to its omission. Concomitant with drainage comes its adjunct, irrigation. It is of the greatest possible use to insure complete removal of *debris*, clots and shreds.

As to the use of solutions, they have

fortunately had their day. Much of the intestinal mischief for which they were responsible will go unrecorded. As to the time for removal of the tube, nothing should influence this more than the nature and quantity of the discharge. When this is clear, sweet and scant, the indications are for removal. It has been held that the introduction of the tube delays union, and increases the danger of ventral hernia. This my own experience discredits. Ventral hernia, I believe, results, in most cases, from two causes: First, a very long incision; and second, getting up too soon and abandoning the abdominal support too early.

A short incision, and due care to keep the patient in bed and at rest, a sufficient time for the margins of the incision to organize and consolidate, together with abdominal support through a period of months, will obviate this trouble.

There is much mischief worked by the use of certain words. They have a vicious significance for students and beginners. Among them are such as "hopeless," "inoperable." They express surgical cowardice, and are responsible for the death, or long-continued suffering of many noble women, who could be relieved of their suffering and their lives spared. They are words certainly not entitled to place in our surgical vocabulary.

The spirit should be all abroad in the profession to go at our work, uninfluenced by self, with the highest courage and the deep persuasion that it is duty to relieve suffering and save life at any and every cost, and not to hesitate or stop until the work is done, and completely done. If this is ideal, then he becomes the better surgeon who sets it up as such, and reaches for it. We cannot save all, but we can save more than we do by less hesitancy, greater promptness, more directness and thoroughness, and through better studied

and more carefully applied surgical art. As to the justification of certain operations there will always be a wide difference of opinion. In this relation we will take the opinion of those who, by their experience, have a just claim to speak.

As to the uterine growths or fibroids, so violently at one time did the discussion rage that the doors of professional courtesy were closed upon the advocates of the operation; and in 1872 a committee of the Academy of Medicine of Paris condemned the procedure, reporting that "the extirpation of a uterine tumor is always a serious matter; the uncertainty that exists of completing the operation, the risk of fatal hemorrhage, the nervous shock, peritonitis, and secondary hemorrhage;" and they concluded by asserting that "the success obtained by some surgeons proved nothing."

The work of different operators differs widely in character. Some good operators absolutely refuse complicated operations; they do large numbers of ventral fixations and shortening of the round ligaments (Alexander operation); they also practise incision and drainage, with a mortality higher than it should be in complete work, say four per cent. in vaginal incision and drainage for pus. All-around complete surgery, as given and practised by the originators of our established procedures, would place us on a good and safe footing.

I have not lost a patient since October 16, 1896. The one dying on that date had been ill for some years. The precise nature of the trouble—suppurating tubes and ovaries, with adhesions extending as high up as the umbilicus—had been recognized by two or more attendants. The emaciation and anemia were alarming, and complete suppression of urine followed the operation.

## FORTY-ONE CONSECUTIVE PERITONEAL OPERATIONS, WITH ONE DEATH; INCLUDING TWELVE HYSTERECTOMIES.

GEORGE ERETY SHOEMAKER, M.D.

[Read March 10, 1897.]

The problems that present themselves for successful work in abdominal surgery in a general hospital differ somewhat from those to be met in special institutions. The purposes of this paper are to illustrate some of the methods that have been found satisfactory under such conditions, as well as to report some results in recent work at the Methodist Hospital. It is not always feasible in the general hospital to secure the approval of the management for a policy of complete separation of abdominal work from every other department of the institution, both as to separate rooms, utensils, clothing, separate instruments and operating room, and permanent separation of a corps of nurses. These measures it has been possible to secure in very large degree through the enlightened co-operation of the Board of Management at the Methodist Hospital in this city, and to this as much as to any other one factor may be attributed such measure of successful outcome as has been recently obtained.

The corps of nurses specially detailed is required to serve in the abdominal department exclusively for a period of months. They are during that term not to be called off as substitutes into other departments, and are under no circumstances to come in contact with septic cases when off duty for an afternoon. A resident physician on duty is not to have charge of doubtful surgical or medical cases at the same time, my own idea being to exclude such a resident from the rooms of convalescent patients, and depend upon the nurse and myself for attendance entirely. In no

other way can a resident be prevented, especially when substituting for a colleague off for an afternoon, from coming in contact with the various infective cases that almost always are present in some department of a hospital, such as acute throat-cases not yet diagnosed, erysipelas in medical wards, or cases in the surgical wards with sloughing burns and the like, cases that must from time to time be found in any surgical ward and that the residents are obliged to dress. I would repeat, it is far better for an abdominal patient not to see a resident physician at all than to see one who cannot protect himself from such exposures.

At the Methodist Hospital three large rooms are set apart for the gynecologic department. To these a patient is taken before her operation and after a bath. She is prepared for section by the special nurses, taken to the operating room in a separate building, returned to the gynecologic recovery-rooms after operation, after which she may return to the ward. It is felt that if the patient is specially isolated and nursed for one week, she may return to the ward with entire safety. She sits up at the end of three weeks and leaves the house in four.

Much attention is given to the preparation of the patient's bowels, skin and kidneys. The kidneys especially are often found to be doing too little work when the case is admitted to the hospital, so that the four or five days are never lost that are devoted to re-establishing the activities of all the organs in the body.



During the preparation bismuth salicylate is frequently administered, gr. iv, four times daily, in addition to salines as intestinal detergents and to inhibit the activity of bacterial or fermentative processes.

For cleansing of skin and hands, after prolonged use of soap and brush, potassium permanganate and oxalic acid are relied upon. These have proved clinically so entirely satisfactory that there is no temptation to experiment with other methods. Gauze pads exclusively are used for sponging. In closing wounds the system of buried sutures for muscle and aponeurosis is adhered to, special attention being given to union of aponeurosis. The intracutaneous suture is used for the skin. In cases in which no pus has been encountered, nothing but baked gauze and cotton is used as a dressing, no powder whatever. Acetanilid is used as a dusting-powder when pus has been found during the operation. Rubber adhesive strips have for several years in my work held the dressing in place better than many-tailed binders. At the first dressing they are cut down in front and pinned up again with safety-pins.

The first dressing is *always* on the fourth day. The object is to inspect the wound and to remove the dressing, which in a small proportion of cases becomes stained with serum. The intracutaneous stitch comes out on the eighth day. The bowels are moved in forty-eight hours, the routine being a tablet of calomel  $\frac{1}{2}$  gr., sodium bicarbonate 1 gr., ipecac  $\frac{1}{4}$  gr., half-hourly till ten are taken; then an enema of Epsom salt one ounce, glycerin one ounce, turpentine one dram, water one pint; then Rochelle salt,  $\mathfrak{zj}$  hourly until a bowel-movement occurs. The routine is stopped at any time when a free movement is secured. It is very rarely necessary to add anything if the foregoing order is followed. In regard to diet, nothing is given by the mouth for twenty-four hours; then gruel and liquid peptonoids (diluted one-half) in alternation every two hours. One ounce is given at a time during the second day. Another ounce of gruel is added daily until six ounces are taken every two hours. Broths take the place

of peptonoids after a day or two, in quantities the same as those of gruel.

I consider the use of the beef-tea enema a distinct advance in the conduct of a case of celiotomy. It relieves the distressing thirst of the first twenty-four hours and has a sustaining power much needed after the catharsis preceding operation, the scanty liquid meal on the morning of the operation, the ether and the loss of blood. This enema is used more and more as a routine measure, beginning as soon as the patient complains of thirst, or if reaction is slow. It has never done any harm, by causing bleeding or otherwise disturbing the field of operation.

A series of consecutive cases is presented that involve a wide range in peritoneal surgery. The series numbers forty-one, with one death.<sup>1</sup>

There are various ways of arranging a series of cases. For example, all the cases of one disease or all the operations of one kind might be put in a group; but it is not without interest to illustrate the ways in which the chance comers of a general hospital service must be dealt with; hence the presentation of a consecutive varied series.

#### CASE I.—*Hysterectomy in an Uncured Case of Celiotomy.*

In October, 1893, after exhausting minor measures in my hands and those of her physician, Dr. M. K. Elmer, of Bridgeton, N. J., I removed a tubal sac, filled with greenish-black fluid, and the corresponding ovary, bound down by old adhesions in the cul de sac behind the uterus.<sup>2</sup> The right tube was normal and was allowed to remain, with its ovary, a cyst in which was punctured. The patient was sterile, though married ten years, and it was thought she might become pregnant. This, however, did not occur. She gained in weight, and for a year or two was greatly relieved of her old pelvic symptoms; but gradually she grew worse again, especially at the site of an old inguinal hernia, the internal ring of which was very large, and into which the right ovary seemed to fall when she was on her feet. Various

<sup>1</sup> Three other cases have been operated upon since, all successfully, so that the series is not yet ended.

<sup>2</sup> See *Medical News*, Sept., 1894.

trusses were tried, with partial relief. Near a menstrual period the truss could not be worn on account of tenderness. The hernia had years ago been operated upon, leaving a distensible funnel-shaped pouch, with little depth as seen from within. Finally, and as a last resort, hysterectomy was done three years after the first operation, with supravaginal ligation. This has resulted in the cure of the patient, who is very grateful and has sent me since two cases for section.

CASE II.—*Fibroma of the Uterus.*<sup>3</sup>

E. D., a patient of Dr. Kisner, of Lycoming Co., was a well-nourished woman, aged 39, having had five children and two miscarriages. She suffered from mild sepsis after the birth of her last child, seven years before, followed by soreness on the left side. A tumor was noticed on the left side, low down, two years before, since which it had rapidly grown. The abdomen was found distended by a somewhat irregular, bosselated mass, larger than a gravid uterus at term, very hard high up and to the left, softer in front to the right, but nowhere fluctuating. Through the vagina the pelvis was found to be completely choked by a hard, immovable, rounded tumor-mass, completely burying the uterus and projecting down below the cervix on all sides. By the greatest effort the os could barely be touched, far back, behind a portion of the tumor that crowded the anterior vaginal wall downward, and evidently grew from the front of the uterus. The veins of the vagina and vestibule were varicose from pressure above. It was this peculiar disposition of the growth, which seemed as though poured into the pelvis and abdomen as into a mold, which caused the enormous difficulties in removal, and consequently cost the patient her life. On opening the abdomen the tumor was found to have dissected up the peritoneum from the anterior wall of the abdomen, the peritoneum passing over upon the tumor at the umbilicus. It had also dissected up and destroyed the identity of both broad ligaments, and was attached at the root of the mesentery, the

peritoneum from which also it had dissected up.

Such a completely sessile fibroma it has never been my fortune to see, the mass overhanging after completely filling the true and false pelvis on both sides and in front in such a way as to make the uterine arteries totally inaccessible for ligation, even after all the preliminary ligation and cutting had been done that was possible. Only a small portion of the right broad ligament was recognizable. After precious time had been lost in attempts to reach the blood-supply by ligature, the constricting wire of the Koeberlé nœud was applied, and the mass, weighing 13½ lbs., removed. The base of the growth was at first too large to be girdled by the wire, but this being held by forceps while the pedicle was being trimmed, the ends finally met and a small stump was obtained, badly dragged down. It was a source of regret afterward that in this case the nœud was not used earlier in the operation as a time-saving measure, though from the very peculiar dissection of the mesentery and parietal peritoneum, the future of the stump would have been doubtful. The patient reacted from the ether, but died at 9.30 the same evening from shock. There was no secondary hemorrhage. So ended the most formidable case in abdominal surgery that it has been my fortune to undertake.

It is my firm belief that the best method of hysterectomy for fibroids consists in ligation from above, dropping the stump. That method is attended with an exceedingly low mortality, and there can be no doubt that it represents the method adopted by nearly all the best operators of the present day. It is the method of choice in almost every case; but there are a very few cases, such as that just reported, in which the nœud could be used to advantage instead of ligation.

CASE III.—*Closure of Ventral Hernia during Pregnancy.*

B., aged 28, who had had three births and two miscarriages, applied for relief from attacks of severe intestinal pain due to an enormous hernia which had followed celiotomy in the hands

<sup>3</sup> This is the only fatal case of the series (No. 10).

of a well-known operator. According to her history she had had a tumor of the ovary removed, had remained seven weeks in the hospital and had discovered a hernia of the wound soon after leaving the hospital, and also that she was pregnant. She was delivered at term, but the pregnancy following so soon upon the section had resulted in extensive separation of the recti muscles. Nearly two years later, when she came into my hands, she was again pregnant four months. She was suffering great pain in the hernia, and as the opening extended quite to the pubic bone, a part of the uterus, bladder and much small intestine fell forward into the great sac. She could only urinate at times by raising up the hernia, and of course with it the bladder. Standing up brought on attacks of pain and vomiting from incarceration of the bowel. Various attempts were made by belts, strapping, etc., to relieve the woman's condition, but as she was very fat (she was short in stature and weighed 186 lbs.), they were useless. It was impossible for her to remain in bed until term, owing to poverty. No institution would keep her. The sac of the hernia was therefore dissected out. The sheaths of the recti were laid open, and buried worngut sutures carefully used to unite muscle and aponeurosis. Beyond a few uterine pains in the first few days, there was no complication; the pregnancy was not interrupted, and she was delivered at term in the Preston Retreat, without a recurrence of the hernia. Probably no other method than buried permanent sutures would have withstood this test.

CASE IV.—*Pelvic Abscess following Pyosalpinx.*

C., aged 24, applied for recurrent attacks of pelvic peritonitis on the right side. A tender mass was felt to the right of the uterus. On section a pus-sac was found at the site of an old pyosalpinx. The abdominal cavity was flushed and drained with gauze and a tube. Recovery ensued.

CASE V.—*Recurrent Umbilical Hernia.*

C., aged 39, very fat, weighing 230 lbs., had suffered for five years from irreducible umbilical hernia, upon which I had operated two years before. She remained

well for eighteen months, when the hernia recurred. As the patient had had several attacks of intestinal obstruction and was unable to work on account of the hernia, its closure was again undertaken. Silk-worm-gut stitches buried for two years were found still strong. They had not caused irritation. The fascia was split. Recovery was uncomplicated. A permanent result was not hoped for on account of the obesity of the patient. Later she reported that the hernia had recurred, that she went to a homeopathic hospital where she was again operated on, the wound sloughing extensively, with burrowing into the fat, leaving a persistent sinus from which there is occasional fecal discharge. She reapplied to me for closure of this sinus, but operation was declined.

The problem presented by an umbilical hernia in a fat woman, when no pad can be kept in place and when attacks of obstruction frequently occur, is a very difficult one. During the years the patient was under observation attempts were made by phytolacca and other remedies to reduce the obesity, but with no practical result, owing to the patient's habits of eating being uncontrollable. The fitting of a retaining appliance was pronounced hopeless by our best instrument-maker. As the result of my two operations she had less than three years of health. Only one of these operations appears in this series.

CASE VI.—*Adherent Retroversion. Hematoma of the Ovary.*

D., 46 years old, unmarried, had for seven years suffered from severe dysmenorrhea and constant pain in the back and head. Pelvic distress followed exertion. She stated that her symptoms began after a heavy lift. The menses were excessive. The uterus was adherent below the sacral promontory. The left ovary was found on section to contain a hematoma. The ovary was removed and the uterus suspended. Recovery followed, and the improvement has been permanent.

CASE VII.—*Retroversion and Descent of Uterus. Ulcerative Cystitis.*

This patient, from Clearfield county, Pa., presented a complicated and formidable condition, requiring long and varied treat-

ment, but a complete cure justified the course pursued. She was 38 years old, and in one of her five labors the function of the levator ani had been destroyed, probably fourteen years before coming under observation. As a result of lack of proper support, the uterus had gradually descended, along with the bladder, causing the formation of a pocket that held residual urine. This had gradually led to the development of ulcerative cystitis at the base of the bladder, with attacks of agonizing bladder-pain. The woman was frequently up twenty-five times at night to pass water. Five years before there had been a discharge of three or four ounces of pus with the urine, and subsequently the urine had always contained pus. Examination showed a slightly enlarged, flaccid uterus, with a wide range of movement, from relaxed attachments; the fundus rested below the sacral promontory. The ovaries were normal, the left adherent in the cul de sac. There was general thickening of the right broad ligament; and much cystocele and rectocele.

The cystoscope showed upon the trigone and the posterior lower wall of the bladder prominent, easily bleeding granulations covered with flocculent pus and having many adherent calcareous granules. No tumor or stone could be found, and the remainder of the bladder-wall was fairly normal. Nothing but drainage of the bladder would cure such a condition. It was decided to make an artificial vesico-vaginal fistula, draining the bladder for some months; then when the cystitis was cured to close this opening and prevent future pocketing of urine by repair of the perineum and suspension of the uterus. Several procedures were carried out. A button-hole opening was made in the bladder in front of the cervix, the bladder and vaginal mucous membrane being stitched together to prevent closure. The bladder was then daily irrigated with a boric-acid solution. Rapid improvement, as demonstrated by the cystoscope, continued. Four and a half weeks later the uterus was suspended from the anterior abdominal wall, and the urine began to dribble constantly from the artificial fis-

tula, while before urine could be retained an hour or two at night if the patient lay on her back, the descended uterus carrying down and pocketing the bladder. Eight weeks after the fistula was established the bladder was normal in appearance and the patient entirely free from the pain that she had suffered for fourteen years. The fistula was now closed by seven silk sutures. Perfect union resulted, and the patient was sent home to test the permanency of the cure before the perineum should be closed and further drainage-operations thereby rendered difficult. Ten months later the perineum was repaired and the patient has remained fully restored to health, having gained greatly in weight and suffering no pain.

#### CASE VIII.—*Adherent Retroversion. Cystic Ovary.*

F., twenty-eight years old, previously reported as a case of bifid uterus,<sup>4</sup> had been sterile, though married five years. She was a great sufferer. The left ovary was removed, and the uterus curetted and suspended by attachment in front. Great improvement in the general symptoms followed. The woman became pregnant in the left horn of her uterus, but aborted at six months.

#### CASE IX.—*Retroversion with Descent. Laceration of Cervix and Perineum. Adenoma of Endometrium. Neurasthenia.*

G., aged thirty-two, the wife of a clergyman near Harrisburg, had three births, and the menses were very profuse. She suffered great distress in the pelvis when on her feet, but was comfortable when lying down. A pessary had given some relief. Hysteria was very marked. Neurasthenia had existed for eight years, and the patient led an invalid life. She had elsewhere had a superficial repair of the perineum made, which gave no relief. The uterus was subinvolved, movable, and descended to the first degree, the fundus being below the sacral promontory. The ovaries were large, extremely tender, the right the worse. The cervix was torn, and there was a severe internal laceration of the pelvic floor, with endometritis. After a

<sup>4</sup> *American Journal of Obstetrics*, Vol. XXXVI, No. 2.

week of preparation, the uterus was curetted and packed, the diseased right ovary removed with its tube and the uterus suspended. Recovery ensued without event, except for tonsillitis on the twenty-third day. Owing to the patient's weak condition, the perineum was repaired, with the cervix, at a subsequent sitting. General massage and medication afterward were employed to combat the neurasthenic state. The late results of the treatment have been that the uterus has regained its normal size, and remains forward in good position, the endometritis and the menorrhagia are cured, the patient walks with entire comfort, and the neurasthenic condition is greatly improved.

**CASE X.—Chronic Appendicitis. Cystic Ovary. Retroversion.**

Miss. X., aged thirty-three, was referred from the Bermuda Islands by a former patient. She dates her disorders from a fall ten years ago. The menses recurred every three weeks, lasted a week, were excessive and preceded by pain. She had always had pelvic distress and pain in the back and on the left side, increased by walking or by a jar. She had had a number of attacks of pelvic inflammation, probably mild appendicitis. She was hysterical and moody, and took morbid dislikes to her family. She refused to speak to any one for days, and she had delusions of dislike by others. The patient was under weight, anemic and constipated.

Examination showed the uterus badly retroverted, the left ovary prolapsed and enlarged to the size of an egg. The region of the appendix was very tender.

At the operation the left cystic ovary was removed and small cysts in the right ovary were punctured, but the organ was not removed. The appendix showed old inflammatory thickening toward its outer end. It was removed, and the stump invaginated in the cecum. The uterus was suspended from the anterior abdominal wall. Recovery was excellent. The highest pulse-rate after the operation was 74. The patient was seen several months later, and then had no distress in taking exercise. She had gained about twenty pounds in weight, and was far

more happy and cheerful than before. Her mental condition had greatly improved. The patient was willing and able to do light duties at home, which marked a great change. The hygienic treatment was to be continued.

**CASE XI.—Ovarian Abscess.**

This case is of much interest because an attempt was made to treat the patient without drainage. By the fourth day she was septic. Re-opening, flushing and draining saved her.

The patient was sent by Dr. Hamilton Mailly, of Bridgeton, N. J. She was twenty-three years old, married, and had one child. Her trouble dated from a septic miscarriage three years ago, when she was in bed six weeks with chills, etc., under the care of another physician. The right side of the abdomen had always been very sore, being hurt by jarring, etc. The patient had had several attacks of local peritonitis, the last a week before. The left tube and ovary were normal. One child was born eighteen months ago, since the trouble began on the right side. The confinement was followed by some fever. Well-marked inflammatory disease being diagnosticated, the abdomen was opened. The right tube was the size of a large thumb, and evidently contained pus. The ovary was the size of a hen's egg, very firmly imbedded in old organized adhesions and riddled with pockets containing varied colors of pus. Some of these were ruptured during the difficult enucleation, but it was hoped that the pus might be sterile. This proved to be an error, as developments showed. The diseased tube and ovary being tied off and the other tube and ovary allowed to remain after freeing adhesions, the abdomen was closed without drainage—the second error. Within the next four days septic peritonitis developed, presenting some very instructive features.

In the first place there was no marked tympanites, and the bowels moved freely; there were twenty-five bowel-movements in those four days. This shows that we may have peritonitis with open bowels and a flat abdomen, and *without any vomiting*. The temperature, however, had gradually mounted to 104.6°,

The pulse gradually became quicker and more accelerated, ranging between 110 and 115. The tongue was dry, pointed and brownish; great restlessness and sleeplessness were succeeded by drowsiness. There was occasional complaint of pain in the right side, the cheeks were flushed, the facies poor. The condition of this patient was such that in two days more death would undoubtedly have followed. She was lifted from the bed to a table, and the wound rapidly reopened under slight ether-anesthesia. The whole peritoneum showed capillary distention, but no flocculi. The coils of ileum in the right half of the abdomen, surrounding the site of operation, were stiff and angular and slightly adherent. There was no fluid in the abdomen. Several gallons of hot water were poured through the irrigating nozzle, all portions of the abdominal cavity being thoroughly flushed. Iodoform-gauze was introduced in three directions, and a glass tube fixed in place. The woman recovered nicely, the drainage-tube being taken out on the fifth day. She was discharged with a small sinus, no doubt leading down to a ligature. Some months later she wrote that she was so well as to surprise herself.

CASE XII.—H., aged 22, suffered from metrorrhagia and endometritis, with retroversion and cystoma of the right ovary. She was curetted, the diseased ovary removed, the uterus suspended, the sound tube and ovary being allowed to remain. Aseptic recovery followed.

CASE XIII.—P., aged 31, presented retroversion and descent of the uterus, with prolapse of a large ovary and constant pain in the region of the appendix. She suffered also from endometritis and a cystocele. At one sitting the following operations were performed: The redundancy of the anterior vaginal wall was corrected by a Stoltz purse-string operation and the uterus was curetted. The abdomen was opened in the median line, and the appendix, which was bound down by a firm band of connective tissue, was released and removed. The small cysts in the left ovary were punctured, both ovaries and tubes being allowed to remain. The uterus was suspended.

CASE XIV.—K., aged 25, had salpingo-oophoritis of the right side, lacerated perineum and an adhesive retroversion. She was a sufferer for many years. The uterus was curetted and packed with iodoform-gauze. Emmet's operation on the perineum was performed, the abdomen was opened, the adherent retroverted uterus freed and attached to the abdominal wall, and the diseased right tube and ovary removed at the same sitting. No drainage was used; aseptic recovery followed.

CASE XV.—M., aged 25, unmarried, gave a history of a large number of attacks resembling those of catarrhal appendicitis. The uterus was completely retroverted and descended. In the presence of her physician, Dr. W. W. Andrews, of Phillipsburg, the abdomen was opened and the retroversion was corrected by suspension. On examination, the appendix was found very long, dipping into the true pelvis, and presenting capillary engorgement throughout its entire length. This same capillary distention characterized the peritoneum of the entire right side of the abdomen. There was no sign of old inflammation. The drainage of the appendix seemed to be perfect, and after careful consideration and consultation the organ was not removed. This has ever since been a source of regret, as the attacks of right-sided colic have not been arrested. The patient made an aseptic recovery.

CASE XVI.—*Constriction of Appendix. Retroversion.*

H., aged 25, unmarried, presented adherent retroversion, disease of both tubes and ovaries, moderate in degree, and a very free vaginal discharge. Microscopic examination did not show the presence of the gonococcus; consequently, on account of the apparently simple nature of the inflammation of the tubes and ovaries, these were not removed, but they were carefully freed from adhesions, the ends of the tubes opened and the retroversion and prolapse corrected by uterine suspension. The appendix presented in its middle portion a constriction, or more properly a congenital atrophy to a tiny cord for a distance of about one-third of an inch; the distal portion beyond this constriction appeared

to be normal in structure. The organ was removed, owing to its abnormal character and the danger of future trouble, the stump being invaginated by suture into the cecum and the abdomen closed without drainage. Aseptic recovery followed.

**CASE XVII.—Cyst of the Broad Ligament.**

F., aged 30 years and married, was sent by Dr. J. Spencer Callen, of Shenandoah, with a history of pelvic peritonitis after an abortion six years before. She presented a cyst of the broad ligament on the right side, which had burrowed deeply into the tissues at the base of the broad ligament, and was covered by extremely firm and troublesome adhesions. The cyst was removed by ligating the broad ligament, both at the uterine end and along the pelvic wall, cutting away all the intervening tissue. Some difficulty was experienced in controlling hemorrhage by this method, and after a rather troublesome dissection, the sac-wall was removed and the abdomen closed without drainage. The patient made an aseptic recovery.

**CASE XVIII.—Pyosalpinx. Hydro-salpinx.**

J., aged 30 years, had old tertiary syphilis, involving the nasal bones, and had suffered for many years with aggravated pelvic symptoms. Owing to the refusal of her husband to have a clean sweep of the diseased organs made, as should have been done, operation was postponed for more than two years, during which time the patient was under more or less constant observation in the dispensary, and was treated by various minor measures. While constantly under treatment, reasonable comfort could be obtained most of the time, but she was subject to violent attacks of pelvic pain and to mild attacks of inflammation that confined her to bed from time to time. Finally, with the thought that the attitude of the husband, who was separated from her, was caused by a desire to interfere with the best interests of the patient, operation was undertaken, with the understanding that both tubes and ovaries should not be removed, although in the interests of good surgery this would probably have been required. On opera-

tion, the left tube was found to contain pus and was removed. The right tube had degenerated into a large hydrosalpinx, which was drained through an opening burned by the thermocautery, and the abdomen was closed, with glass drainage. The patient made a good recovery and has been much relieved of her old symptoms, which were chiefly referred to the side on which the pyosalpinx existed.

**CASE XIX.—Diseased Appendix. Retroversion with adhesions.**

H., aged 34, had suffered for many years from various pelvic symptoms. She presented a retroversion, with inflamed, adherent left tube and ovary, and much tenderness in the region of the appendix. On opening the abdomen and separating the adhesions of tube and ovary, these organs were found to be sufficiently good to justify an attempt to save them. They were, therefore, not removed. The uterus was suspended, to overcome the retroversion and to prevent its falling again with the tube and ovary into Douglas' cul de sac, and the re-establishment of adhesions in this abnormal position. The appendix presented traces of old inflammatory attacks; it was stiff and hard, and, after separation from adhesions, could be held up like a pencil. It was removed, the stump invaginated, and the abdomen closed without drainage. Recovery followed without complication.

**CASE XX.—Cyst of the Broad Ligament.**

D., aged 36, unmarried, had been ill for four years following an attack of peritonitis. There was a mass in the anterior abdominal wall above Poupart's ligament, about the size of a walnut, apparently a fibroma, although somewhat tender. It was underneath the abdominal muscles and was not disturbed. A cyst occupied the left broad ligament, being very deeply situated. Over the top of it passed the round ligament. The base of the sac was tied off with difficulty, and the Paquelin cautery lightly used, owing to the uncertain character of the hemostasis. The wound was then closed without drainage, and normal recovery ensued.

CASE XXI.—*Salpingitis, Prolapsed Cystic Ovary. Endometritis, Retroversion.*

J., aged 20, married, had never been pregnant. The uterus was undeveloped, and much tenderness existed on the left side, which frequently incapacitated her for work. For four years she had had hysterical attacks. The left kidney was tender on pressure, but not enlarged. Catheterization of the ureter on that side betrayed nothing abnormal beyond diminished function. The left tube and ovary showed old inflammation; the uterus was retroverted. The patient was treated by local and general methods for a long time in the dispensary, and, not showing improvement, she was brought into the hospital and treatment personally continued for some weeks, without marked benefit. The abdomen was then opened and the diseased left tube and ovary removed, and suspension of the uterus effected. The woman made a good recovery from the operation, but only temporary benefit, lasting for a few months, resulted. The patient afterwards fell into the hands of another surgeon, who performed hysterectomy from above, from which operation she also recovered, and I have learned that much benefit has resulted.

CASE XXII.—*Retroversion. Cystic Ovary. Lacerated Perineum.*

K., aged 33, married, had borne one child, and had had one miscarriage, had attacks of hystero-epilepsy not associated in any way with the menstrual period. She had suffered for three years with bearing-down pain, dysmenorrhea, and between the periods with much paroxysmal pain on the right side, increased by lifting. The perineum was badly torn, and there were rectocele and cystocele. The uterus was retroverted and below the promontory of the sacrum. The left ovary was in Douglas' cul de sac. An Emmet operation was performed on the perineum, and one week later the abdominal cavity was opened. The left prolapsed ovary being in process of cystic degeneration, was removed and the retroversion corrected by uterine suspension. The right ovary was not removed. Normal recovery ensued. She is now being treated by general massage and other methods for hystero-epilepsy.

CASE XXIII.—*Hematoma of Ovary.*

R., aged 49, married, with four children, suffered greatly from bearing-down and pain in the rectum. For two years the menses had been frequent and irregular, the flow being at times almost constant. She had a lacerated perineum and cervix, and a tubo-ovarian mass to the left of the uterus the size of a fist. Currettings were examined microscopically for malignant disease of the uterus and showed none. The abdominal cavity was opened; the right tube and ovary were normal; the mass on the left side consisted chiefly of a hematoma of the ovary, the largest sac containing two ounces of chocolate-colored fluid. The diseased tube and ovary were tied off and removed. The uterus was suspended. Recovery followed without complication.

CASE XXIV.—*Retroversion with Descent. Fibroid. Myomectomy. Uterine Suspension.*

S., aged 29, unmarried, was sent by Dr. M. B. Hartzell. For several years she had had in the intervals between periods a feeling in the right lower half of the abdomen as though a raw surface were being chafed. This sensation passed around over the right hip. She was decidedly worse after walking or working. She was comfortable when lying down, but was always up at night from five to six times for urination since girlhood; she was never able to walk more than one or two blocks without urinating. She had had various forms of minor local treatment at the hands of other physicians, without benefit. The movement of the bowels and urination had no effect in increasing the pain. The patient, on examination, was found to have a small uterine polypus, protruding from the os, with very marked retroversion of the uterus and a fibroid nodule in the anterior wall. By repeated attempts it was demonstrated that when the retroversion was overcome by a wool pack the patient was entirely comfortable. When the uterus was again allowed to retrovert the frequent urination returned, with the "raw" feeling in the right side. After extended observation it was decided to suspend the uterus by abdominal incision and to remove the fibroid nodule. This



was done, the nodule being shelled out of the uterus and its site closed by suture. The patient made a perfectly normal recovery and has remained entirely well as a result of the treatment. In this case the symptoms were probably due to pressure of the fibroid nodule upon the bladder when in the upright position, as well as to the retroversion.

**CASE XXV.—Double Pyosalpinx. Metritis. Hysterectomy.<sup>5</sup>**

P., aged 26, who had borne three children and had had three miscarriages, presented disabling symptoms from her last miscarriage, three months before, when she had peritonitis. She took morphin freely. She was found to present double pyosalpinx, metritis and many adhesions as a result of old pelvic peritonitis. The uterus was large, tender, and firmly adherent in retroversion. Hysterectomy was done by the suprapubic method, with amputation at the internal os. The patient made an excellent recovery, although almost maniacal for the first three or four days, owing to the sudden withdrawal of the morphin, as it was not known until this time that she had acquired the morphin-habit. No drainage was used.

**CASE XXVI.—Hysterectomy.**

Y., aged 30, married, who had borne seven children, and had no miscarriages, had had the perineum torn and repaired twice. She suffered from much straining in urination, with soreness and pain in the left ovarian region for two years, at times severe. She gave a history of having suffered for three months, from February to May, with gushes of from two to three ounces of brown, watery fluid when stooping, from three to six times a day, preceded by pain, and she was obliged to wear napkins constantly during that time. At the end of this period a sharp hemorrhage occurred during menstruation, and a free discharge of blood continued for five days. She had lost thirty-five pounds in three months, and had been unable to work for five months. The uterus was badly descended and retroverted. It was enlarged to twice its normal diameter. From before

backward the canal measured three and one-half inches. The curet withdrew much hypertrophied gland-tissue. The patient had suffered so much as to be extremely anxious for total removal of all offending organs. Owing to the degeneration of the endometrium and the enlargement of the uterus itself, hysterectomy was performed by the suprapubic route, the broad ligaments being tied off with silk. The patient made a typical recovery, has since been entirely well, is one of the most grateful patients it has ever been my fortune to operate upon, and feels that she cannot do enough for the institution which so greatly relieved her suffering.

**CASE XXVII.—Lacerated Perineum. Retroversion with Descent. Neurasthenia.**

P., aged 53, sent by Dr. Henry W. Elmer, of Bridgeton, N. J., had borne three children, and had passed the menopause two years before. For nine years she had been neurasthenic, and was often confined to bed for periods of from two to three months without definite disease. She had morbid ideas as to difficulty in defecation, and great exhaustion followed the effort, which frequently consumed two hours. There was no constipation. The woman complained of bearing-down pain in the left ovarian region and inability to walk, which she attributed to the pelvic condition. There was no endometritis, but great relaxation of the supports of the uterus and the bladder. The bladder was imperfectly emptied. The uterus was in the first stage of prolapse; retroversion was complete. Owing to the great relaxation of the tissues, the repair of the perineum was considered insufficient to effect a cure, and the uterus was therefore suspended, in addition to the repair of the pelvic floor. Aseptic recovery ensued, after which massage and electricity were employed to restore the general tone. The patient was discharged well, and to her great delight, she was able to walk considerable distances without distress, more than for many years.

**CASE XXVIII.—Adeno-Carcinoma of the Uterus. Hysterectomy.<sup>6</sup>**

<sup>5</sup> This case was reported in *The Therapeutic Gazette*, October, 1896.

<sup>6</sup> This case was reported in the *American Journal of Obstetrics* for April, 1897.

H., aged 63, was sent by Dr. J. R. Bryan. She had borne three children. The menopause had never appeared. Since the time it was due there had been several free bleedings every year; during the preceding six months there had been daily hemorrhage, at times severe. The case was originally one of benign adenoma, which had undergone carcinomatous change. The patient was anemic, and subject to morbid mental states, hypochondriac; she had a habit of wandering from home. There was no pain, and no unusual odor. A diagnosis of malignant disease of the body of the uterus being made, three days later hysterectomy was performed. Excellent recovery ensued. A microscopic diagnosis of adeno-carcinoma was made by Dr. H. W. Cattell.

CASE XXIX.—*Malignant Adenoma of the Uterus.*

X., aged 39, was sent by Dr. W. R. Hoch. She had borne one child, thirteen years old, and had had no miscarriage. The periods recurred every three or four weeks, for five days, the quantity being normal. The woman complained of bearing down on both sides; her chief symptom was pain in the back, occasionally sharp, and shooting to both knees in front. There was also constant dull pain. The vaginal discharge was white, constant; never bloody or offensive. There was a laceration of the perineum. The uterus was not enlarged. It was pushed forward, though freely movable, and no infiltration was demonstrable by touch. The os was slightly excavated. Around it was an area of dark, angry red, glandular degeneration 2 cm. in diameter. The utero-sacral ligaments were tense and tender. A shield-shaped patch, 1½ cm. in diameter, occupied the posterior wall of the vagina, at the point where the cervix normally lies in contact with it. This resembled a superficial glandular degeneration or erosion and had nothing characteristic of malignant disease in appearance or to the touch. Although the case was only slightly suspicious, a piece was excised for microscopic examination and submitted to Dr. Henry W. Cattell, who diagnosed decidedly malignant adenoma in an early stage. Vaginal

hysterectomy was at once performed, and the diseased patch excised from the vagina. Uncomplicated recovery ensued. On examination by the microscope the tissue from the vaginal wall showed the same malignant change as that in the uterus. The case is a very unusual one, because of the apparent transfer of the disease by contact and not by direct extension. No enlargement of the lymphatic glands could be demonstrated.

CASE XXX.—*Appendicitis.*

S., aged 23, unmarried, had during the preceding three years had several attacks of right-sided pelvic inflammation referred to the region of the appendix. She had been obliged to leave her employment several times on account of these attacks. There was tenderness over the appendix, and there was pain in walking or lifting. The abdomen was opened, and a somewhat adherent and thickened appendix, which had been the seat of inflammatory disease, was removed, and the stump invaginated in the oecum. Several small cysts in the ovaries containing clear fluid were punctured. The tubes were normal. The ovaries and the tubes were not removed. Aseptic recovery ensued, and was followed by massage and electricity to improve the nervous symptoms. The patient was discharged well.

CASE XXXI.—*Uterine Dermoid. Hysterectomy.*<sup>7</sup>

B., aged 58, had borne two children, and had passed the menopause fourteen years before. For a year, at intervals, there had been free bleeding from the uterus, lasting several days at a time. A constant, very copious, grayish or pinkish discharge, having an odor of decomposition, escaped from the uterus. This had formerly been like the washings of beef. There was constant, burning pain through the abdomen and back. The woman had been losing flesh for a year. There was frequent micturition, with pain. There had been a chill, followed by fever, two weeks before. The uterus was enlarged symmetrically; its length was four inches;

<sup>7</sup> This case was reported as a uterine dermoid in the *American Journal of Obstetrics*, Vol. XXXIII, No. 6.

its fundus was adherent, low and backward. The uterine cavity was found to contain much soft, white cheesy, sarcomatous-looking material. Malignant disease being suspected, total hysterectomy was done from above by the ligation method. Neither pulse nor temperature exceeded 100 after the operation. Recovery was aseptic. The contents of the uterus were highly offensive. Microscopically, the masses consisted largely of fat crystals. A hard nodule was situated in the posterior wall of the uterus, below the origin of the left tube. Drainage by gauze and glass was provided for.

CASE XXXII.—*Epithelioma of the Cervix. Hysterectomy.*<sup>9</sup>

H., aged 54, had borne seven children, had had three miscarriages, and had passed the menopause two and a half years before. The patient complained of burning pain, and a slight, irritating, bloody vaginal discharge, without odor, for three months. There was slight cachexia, but very little loss of weight. Examination disclosed a small, freely movable uterus, rather low, the body apparently normal, the cervix hardened, not enlarged or thickened, the os somewhat excavated; three hard, wart-like projections, one-sixteenth inch in diameter, were situated to the right, at the edge. The lower lip of the cervix was infiltrated over an area one-quarter by one-half inch. A diagnosis of early epithelioma was made. The vagina was not involved, and there was no glanular infiltration. Hysterectomy was performed. The highest pulse during convalescence was 96, the highest temperature 100.4°. Microscopic examination confirmed the diagnosis of epithelioma.

CASE XXXIII.

Y., aged 42, had a ventral hernia, following through-and-through closure of an incision four years before, at my hands. The hernia first appeared during excessive vomiting from sea-sickness. The sac and the scar were dissected out; the peritoneum, the muscles and the aponeurosis were separately sutured by kangaroo tendon; the skin was united by intracutaneous suture. Aseptic recovery followed.

CASE XXXIV.—*Painful Bleeding Fibroids. Hysterectomy.*<sup>9</sup>

H., 48, married, had borne one child. She had bled recently five months without cessation. She complained of severe pain originating near the neck of the bladder, and causing nausea and sweating. She was addicted to the use of morphin, and had mental peculiarities. Hysterectomy was performed by the combined abdominal and vaginal routes. Good recovery followed.

CASE XXXV.

E., aged 38, married, had suffered from menorrhagia and dysmenorrhea for four years. She had bearing-down and pelvic distress, with severe laceration of cervix and perineum, and retroversion, with descent of the uterus. There was suspicious degeneration of the glands about the os uteri, but tissue excised and examined microscopically was reported to be benign. The following operations were performed at one sitting: The cervix was repaired with catgut, the suspicious tissue was excised, the perineum was repaired by an Emmet operation, the abdomen was opened, and the uterus suspended. The body of the uterus was larger than normal, and showed yellowish-white mottling, but no distinct evidences of malignant disease. Aseptic recovery followed.

CASE XXXVI.—*Broad Ligament Cysts and Ruptured Tubal Pregnancy.*

V., aged 30, married, had borne three children, the latest twenty-two months previously. There was no history of miscarriages, but one of post-puerperal peritonitis after the first labor. The patient had never been well since marriage. Menstruation recurred as usual every three weeks, until the preceding six weeks, during which there had been a constant flow. The patient complained of pain in the left breast, and also in the abdomen, on the right side, increased by work, walking or jolting. There was no definite history of collapse following rupture of tubal pregnancy, but there was considerable suffering much of the time from pain in the abdomen. The real condition had been masked. On examination, the left ovary and tube

<sup>9</sup> See *Therapeutic Gazette*, Oct., 1896.

<sup>9</sup> *Therapeutic Gazette*, Oct., 1896.

were found doubled in size, and tender. The right ovary was part of a mass the size of a child's head, that filled the right side of the pelvis, and extended behind the uterus, beyond the median line. The mass was very tender and tense, and appeared to contain fluid. The uterus was limited in movement, and was forward against the pubic bone.

The left tube and ovary were found to be densely adherent; the ovary contained four small cysts the size of walnuts. The right ovary was buried in a large mass that filled most of the pelvis. This mass consisted of a sac, whose walls were made up of adhesions and inflammatory tissue, and whose contents were dark blood-clots and degenerated material resembling placental tissue. Owing to the extensive destruction of both tubes and ovaries, the large amount of raw surface left after enucleation of the diseased organs from adhesions, and the fact that satisfactory stumps could not be made on the uterine side, the entire uterus was removed, with the diseased tissues, by the ligation method, a cervical stump being allowed to remain. The abdomen was closed without drainage, and the patient made a somewhat slow but afebrile recovery, the highest temperature being  $100.2^{\circ}$ , the absorption-rise twenty-four hours after operation. When very extensive destruction of the pelvic organs is present in these cases, I believe that hysterectomy, in addition to removal of the degenerated organs, adds to the chances of the patient's making a permanent recovery that will be satisfactory in all respects.

CASE XXXVII.—*Double Gonorrheal Salpingitis. Oophoritis. Metritis. Fibro-cyst of Uterus. Hysterectomy.*

S., 27 years old, married, sterile, was very highly neurotic on admission to the hospital, exhibiting hysterical aphonia and tremor of the eye-lids. She frequently fell at home, or on the street, in what were probably hysterical attacks of faintness without convulsions. She had had several attacks of pelvic peritonitis. She attributed her nervous condition to family trouble and to suffering. The statement is made by some neurologists that severe nervous disorder

is not frequently met with in connection with grave pelvic disease. The present case is a marked example of the association of the two conditions.

On opening the abdomen the omentum was found firmly adherent to the brim of the pelvis in front and required ligation. Well-organized, firm intestinal adhesions bound the small intestine firmly over the uterus, tubes and ovaries. After a tedious separation on the right side a firm, tense cyst the size of a large orange was found behind the uterus, extending toward the right side, and springing from the posterior wall of the uterus. It contained clear, thin fluid, and was unilocular. The right ovary was densely adherent, low down and far out; it contained a cyst the size of a walnut, with thick walls, the inner lining of which was covered with round, calcareous projections. The contents were yellowish-white in color, without odor, and resembled pus. The tube and ovary of the left side were disorganized by inflammation. Owing to the dense adhesions and organized inflammatory tissue, silk ligatures were placed outside both ovaries and tubes, and the broad ligaments ligated down to the uterine arteries on both sides; both tubes were removed, and the uterus was amputated at the internal os. The cervix was closed from within the abdomen by sutures, the peritoneum stitched over raw surfaces as far as possible, and the abdomen closed over an iodoform-gauze pack in the pelvis. This was removed in forty-eight hours, a glass tube inserted, and removed forty-eight hours later. The wound remained aseptic, and the patient made a good recovery, except for separation of the united superficial portion of the wound while straining at stool two weeks after the operation. This was treated with adhesive strips, and the patient was discharged on the forty-second day. Seven months later she re-applied for treatment. The general nutrition had greatly improved; she had no more "falling spells," but suffered from flashes of heat. The menses had not appeared. She was, however, complaining greatly of symptoms of cystitis, with pain in the region of the left kidney. The feet and

legs were edematous. The urine contained pus, and at times blood, but no casts. A milk-diet was prescribed, and the bladder was irrigated with a boric-acid solution, with the result of practically curing the bladder-condition. There was no stone present. The general health of the patient is now wonderfully better than before her operation, and she is able to earn her living.

**CASE XXXVIII.—*Fibroid Uterus and Lacerated Perineum with Descent.***

S., aged 49, a patient of Dr. Gutshall, of Perry county, with nine children and two miscarriages, had suffered from constant bearing down for six years. Though 49 years of age she menstruated every two weeks. The duration of the period was from seven to fourteen days, the quantity was excessive, and there had been pain in the right side of the abdomen for twelve years, increasing lately. There were also swelling of hands and feet, dizziness, etc., probably due to anemia. The uterine canal measured four inches, and there was symmetric enlargement of the uterus to about three times its normal dimensions. An offensive muco-purulent uterine discharge had been present for one year. The woman had lost 25 pounds in the preceding year. The history and appearance of the uterus strongly suggested malignant disease, and vaginal hysterectomy was performed by the ligation method, much difficulty being experienced on account of the large size of the uterus.

The patient made an uncomplicated recovery.

**CASE XXXIX.—*Double Salpingo-Oophoritis and Endometritis.***

F., 21 years old, married five years, without children, had had a miscarriage two years before. She had been well until that time, but, since, the periods returned every two or three weeks, lasting from three to seven days. The quantity was excessive, and there was great pain. Between the periods there was cramp-like pain on both sides, chiefly on the left, caused by walking or by cold. There was a yellowish bloody discharge, offensive at times, which often followed an attack of expulsive pain. She had been

in bed one year before for three months, with a pelvic inflammatory attack. There was found double disease of the adnexa, which were firmly fixed by adhesions.

At the operation the uterus was curetted and tincture of iodine was applied to the canal; the abdomen was opened, both tubes and ovaries being found buried in exudate and adherent to the surrounding bowel and to the bladder. The right tube was hopelessly disorganized, containing pus, and, with its ovary, was removed. The left tube was club-shaped and contained fluid; the fimbriae had been rolled in, but the process of destruction and sac-formation was apparently not yet complete, as a dimple appeared at the site of the abdominal ostium of the tube. It was hoped that the contents of the tube might prove to be non-infective, and that the tube might be saved, but on introducing a pair of forceps at the site of the depression mentioned and separating their blades, an abundance of pus escaped. The tube was therefore removed, with its corresponding ovary, which contained several small cysts. The appendix appeared normal and was not removed. The abdomen was closed without drainage, and the patient recovered nicely and was discharged well. She was entirely well for four months, but became thoroughly drenched with rain while at a picnic. Since that time, while entirely free from pelvic distress, she has occasionally suffered from sharp cramp-like pains in the region of the splenic flexure of the colon, which are in my judgment due to intestinal colic. She has gained in weight, is well developed and strong, a large healthy-looking woman, but somewhat hysterical and inclined to lead a sedentary life on account of these pains. It being impossible to secure proper moral treatment at her home she was admitted to the hospital eleven months after her operation, for massage and high enemas, under which treatment she immediately improved and walked daily from four to five miles with entire comfort. She has absolutely no pelvic lesion.

This case illustrates the importance of general management of pelvic disease after operation. If no pelvic disease exists the

patient must be required to resume her ordinary life, and moral methods must be used to disabuse the mind of the continuance of disease.

CASE XL.—*Cyst of the Broad Ligament. Old Appendicitis.*

W., 25 years old, of Virginia, unmarried, presented a cyst on the right side, three inches in diameter, which distended the mesosalpinx, but was in the broad ligament proper. It was removed unruptured, with the corresponding tube, which passed over its upper surface. The appendix was thickened, somewhat adherent and had been inflamed. It was removed and the stump invaginated into the cecum. No drainage was provided, and aseptic recovery followed.

CASE XLI.—*Relapsing Appendicitis. Salpingitis.*

D., aged 33, unmarried, a patient of Dr. C. H. Willits, was a very highly hysterical and neurotic chronic invalid, who had had several attacks of pelvic peritonitis originating in the right side. When admitted she had been in bed nearly all the time for six months. The general condition was poor. Owing to the existence of pelvic masses on both sides, a median incision was made, and the omentum freed from the right side of the pelvis and the uterus. The tubes and ovaries were found buried by small intestine and bladder, which were bound down by adhesions almost cartilaginous in density. The layers of exudation were thoroughly organized and frequently half an inch in thickness. The bladder was attached to the whole of the anterior wall of the uterus and on top of the fundus, and was separated with great difficulty, but without rupture. Between the bladder-wall and the uterus two cysts were found, each containing two or three drams of clear fluid. After a tedious dissection, the appendix was found dipping down into the true pelvis, and it was removed. The organ was very hard and firm, its walls thick and friable. It had never been perforated. The right tube was with great difficulty delivered and found to have been, with the appendix, the focus of an attack of inflammation. The other organs appeared

sound and were not removed. The abdomen was closed without drainage, and although after the operation the patient was quite weak, an excellent aseptic recovery followed, the highest temperature recorded being 99°.

Seen nine months later, the patient is found to have gained very greatly in weight, health, spirits and comfort. She has regained her normal weight, has resumed the ordinary habits of life, and her nervous condition has greatly improved. There has, however, been one attack of mild inflammation on the side not operated on.

During the period covered by the abdominal operations here reported a large number of minor operations were also performed. In a number of the abdominal cases other operations were performed at the same time. For example, the vermiform appendix was removed when diseased, and at times the lacerated cervix or perineum repaired, curettement done for endometritis, or hemorrhoids treated by ligation. In doing multiple operations at the same sitting the condition of the patient is carefully considered. Many operations, minor in themselves, may be done rapidly in succession with little shock, and if the condition of the patient continues good much gain is made, providing the entire time consumed by the procedures is not sufficiently great to in any way imperil recovery. It need scarcely be said that, when grave operations are undertaken, such as hysterectomy complicated by pelvic abscess, or for large fibroids, all minor operations are deferred until some more suitable time. The ability to combine several procedures, such as ligation of hemorrhoids, repair of perineum and removal of a troublesome appendix or tube, will depend upon the skill and rapidity of work of each individual operator, and upon the skill of his assistants.

During the period covered by this report the vermiform appendix was removed eight times, but in only one case was this the only operation performed upon the patient. Hysterectomy was done twelve times, by various methods. In one case the uterus and the vermiform appendix were removed at the same operation. In

removing the vermiform appendix the median incision was invariably used. With the patient already in the Trendelenburg position for the pelvic operation, the necessary pressing back of the intestines from the true pelvis almost always either brings the appendix into view or renders its discovery quite easy. When firmly bound down its removal by the median incision is more difficult than through the lateral incision; but this difficulty is not sufficiently great to warrant making another opening.

Myomectomy for uterine fibroid was done once. Diseased ovaries or tubes were removed twelve times. The uterus was suspended seventeen times, but in only one case was this the only operation done upon the patient. Suspension of the uterus was usually combined with repair of lacerated perineum and cervix, with curettement for endometritis, and in several cases with the removal of one diseased tube or ovary. When both tubes and ovaries are removed the tension on the broad ligaments is usually sufficiently great to hold up the uterus without suspending it by stitches. Amputation of the cervix was done once. Curettement was done fifteen times. Lacerations of cervix and perineum were repaired fifteen times. Two uterine polypi were removed. In one of these cases, a patient of Dr. W. C. Dixon, the woman, who was unmarried and 28 years old, had bled excessively for one year at her periods, and had suffered much pain. The periods had recurred every two or three weeks, and lasted from eight to twelve days. The polypus was more than one inch in diameter; having been squeezed out of the uterine cavity, it hung free in the vagina by a narrow pedicle. It was extremely hard, and was composed of fibrous tissue.

Two inoperable cases of carcinoma of the cervix were cauterized for temporary relief. Nephrotomy was done once. Four cysts were removed from the abdominal cavity. Hemorrhoids were ligated four times. Fissure occurred once, and in two cases suppurating vulvo-vaginal glands were dissected out. In five cases a reef was taken in the anterior

wall of the vagina in addition to the perineal operation. Extra-uterine pregnancy occurred but once in the series of forty-one cases. Abdominal drainage by gauze or tube was employed four times, or in about ten per cent. of the cases. A large number of cases were refused operation because the lesions were not considered sufficiently great to warrant it. These cases included minor salpingitis, prolapse of the ovary, and mild forms of relapsing pelvic peritonitis. One case only was refused operation on account of its severity. In this case, which was sent from Malaga, New Jersey, by Dr. D. H. Oliver, a woman aged 24 years presented general edema of the lower limbs and abdomen, with multiple sarcomata widely disseminated over the body. Some of the tumors on the chest were 4x2 inches in size; one nodule on the neck was posterior to the sternocleido-mastoid. The abdomen was distended by several irregular intra-pelvic tumors, while one of the growths pressed downward the posterior wall of the vagina, and was nearly the size of a child's head. One of the nodules was removed for microscopic examination, with the result previously stated. Operation was, of course, out of the question, on account of the wide diffusion of the growths, and after consideration of the prospects of the use of injections of serum, all treatment was declined. In one case of carcinoma of the uterus and ovaries with marked ascites, operation was abandoned on account of the dissemination of the growth to other regions of the abdomen. This was the only exploratory operation in the group.

In two cases the uterine cavity was carefully scraped with a dull wire loop, in septic conditions following abortion. It is my custom, when seeing such cases early, to use the finger for cleaning out the uterus prior to irrigation, if the placenta has not yet been expelled. When the case is not seen until the uterus is emptied and is well contracted, it is not considered wise to subject the uterus to sufficient dilatation to admit the introduction of the finger as far as the fundus, and therefore, under moderate use of the branched dilator, the dull wire loop is used, or the small placen-

tal or curet forceps of Emmet. This procedure makes it certain that no small septic masses have been retained; but care must be taken not to scrape so vigorously as to open new channels for absorption.

In one case a patient sent in with a supposed bleeding abdominal tumor was found to have an unsuspected six months pregnancy, with a dead fetus. A woman friend, formerly a physician, had been allowed to make an examination some weeks before, and had used a sound. The patient was extremely weak from loss of blood, but fortunately was not septic. There was complete uterine inertia. The liquor amnii had escaped. After days of gradual dilatation and stimulation by the iodoform-gauze pack introduced through the os, followed by a tight vaginal tampon, which arrested the hemorrhage, I was able safely

to extract the fetus by morcellation, under ether. Not a sign of a uterine pain appeared at any time. The patient made an excellent recovery without fever, but two weeks later developed some swelling of the left lower extremity, due no doubt to mild phlebitis.

All of the minor operative cases recovered except one. A case of criminal abortion, profoundly ill from septicemia when admitted, was gently curetted with the dull-wire loop; but was unimproved by any treatment, dying three days later.<sup>10</sup>

In reporting this series of peritoneal cases, the histories are taken from the hospital records. In the forty-one cases one death occurred. This statement is made without a reservation, and no deaths (from pneumonia, nephritis or other cause) are excluded for the sake of statistics.

## DISCUSSION.

DR. G. BETTON MASSEY took exception, in the absence of personal experience and well-weighed and well-verified views, to what had been said about the Apostoli method. In drawing hasty conclusions in questions of this sort—questions in which new methods are advocated—it should be remembered that gynecologists are now enjoying the results of work that gave only obloquy to some of their predecessors.

The final decision in this question, by the general profession, would have consigned it to oblivion if the opinion of inexperienced opponents were to be taken as facts. All such questions must be decided by the results, and the results in skilled hands, and it is interesting that large series of abdominal sections can be done with few deaths. In the decision of the other question, it may be of interest to know that in a series of eighty-six cases of fibroid tumors of the uterus treated by electricity (largely by Apostoli's method) by Dr. Massey, in twelve cases almost total disappearance of more or less large tumors occurred without any bad results whatever to the patients, and that of the whole number of 86 cases, some 85 per cent. were very markedly benefited by the treatment, all the way from symptomatic relief to half, one-quarter or one-third diminution of the growth, and that out of the whole number but one case died, and that on account of a mistake in diagnosis by an eminent surgeon. This was

a case of cystic intra-uterine tumor which had long since been debarred from any electric treatment, and should be thrown out as out of the question completely.

Dr. Massey did not undertake to decide how many surgical operations shall be done, and it is not a question for the surgical operator to decide whether or not some of his cases cannot be treated by some other method equally well or better.

DR. JOSEPH PRICE said that the mortality in some of the more prominent hospitals in the country has decidedly increased, notwithstanding they are not confining themselves to actual disease-operations. A good operator should never lose a patient in an Alexander operation, or a ventrofixation, or an operation for removal of non-adherent appendages, freeing of adhesions or complications. Tubal occlusion, with retention of blood, pus or water, without adhesions, is exceedingly rare, and under such conditions the mortality should always be nil. Some operators will not touch cases presenting these features, and should not touch them. Dr. Price has no hesitancy in operating for tubal occlusion with retention of any character. The patients are always sufferers from marked local or general disturbances. Dr. Price alluded to the nervous disturbance arising in some cases

<sup>10</sup> See *Amer. Jour. Obstetrics*, May, 1897.



of ventrofixation, and referred to a patient with vesical tenesmus and a host of other ills following this operation, who was relieved only when the uterus was freed. Dr. Price referred to another case in which he made an extensive dissection for ventrofixation that had been well-done or over-done. He removed a V-shaped piece of scar-tissue from the bladder, together with all inflammatory deposit, stitched the bladder and released the uterus, with perfect recovery, the woman regaining flesh and strength and becoming cheerful, and all nervous symptoms vanishing. To secure cleanliness Dr. Price employs water, soap and brush, together with mustard, as recommended by Park. Carbolic acid leaves the hands numb and tingling. Mercuric chlorid makes them harsh, sore, painful and incapable of being cleansed. A hand cleansed with soap, water and mustard is a surgical and tactile hand—soft, very rarely irritated. Drainage is of value in all cases, whether or not simply post-puerperal, or due to leaking appendicitis, or suppurating dermoid. If adhesions are free, cleansing, draining and arrest of sepsis should be followed. This plan of treatment is the only one worth following or mentioning. Dr. Price referred to a case of post-puerperal sepsis, with pus up to the level of the umbilicus, and the right kidney suppurating. Three-fourths of the abdomen was drained, the kidney laid open and drained, and the woman entered upon recovery.

It is impossible to use rectal enemata when lesions of the rectum or sigmoid flexure exist, but what Dr. Shoemaker has said is perfectly true in that connection. The open treatment is simply horrible, and it has but one object, viz.: to arrest sepsis and to save the patient. The surgeon may do what he likes afterward. Dr. Price referred to the case of a woman with an enormous ventral hernia, who was dying from appendicitis. Her surgeon laid open the pus-sac and drained it: but a short time afterward the hernia sprang up like a boy's hat. Dr. Price opened up and freed adhesions, and it was surprising how few adhesions existed. He removed the so-called sac, approximated the muscles, and got a good result. Primarily the operation was done to save the patient's life. The open treatment has but one object—that is to save the patient. The perfection or completion of the work must be undertaken later. As to choice of method in hysterectomy, it may be said that the mortality by the extra-peritoneal method, the mortality by the Koeberle, has always been the lowest. If there is ideal, good surgery done in America it is done at the Johns Hopkins Hospital, where the mortality in the 1894 report stands at exactly 10 per cent. in abdominal surgery. This statement is made to emphasize the fact that the extra-peritoneal method of doing hysterectomy is the only one that will give a *nil* mortality, or a very low one. The surgeons at Johns Hop-

kins practised extirpation or intra-peritoneal methods and condemned drainage.

As to ventral hernias, it may be said that nothing trains a man better in abdominal surgery than repeating operations. The incomplete and abandoned ones, or the doing of them over, teaches the most. Thus, a surgeon has removed one tube or ovary, and has failed to complete the operation. Bad symptoms and hernia follow. Repetition of the operation is one of the most difficult tasks in intra-pelvic or abdominal surgery, and more can be learned from five abdominal sections abandoned than from a hundred simple primary abdominal sections. Drainage has made possible triumphs in pelvic surgery. In all suppurative forms of peritonitis section followed by irrigation and drainage will save a larger number of dying patients, be the etiologic factor what it may.

DR. M. PRICE said, concerning ventral fixation occurrences and multiple operations, that human life is too valuable to submit to multiple operations. Now and then an accident may occur in the very best of hands from the simplest procedure, and when a man does three or four such procedures he may have ninety-nine women live; but how if he loses the one hundredth woman? He has no justification either to himself or before a court of justice; but he should be held to strict accountability for the loss of that life.

Curettement in puerperal septic cases is unjustifiable. There is no sense in introducing a sharp instrument and curetting not only diseased portions of the uterus where the placenta is attached, but all other portions of the uterus, laying them open with fresh wounds to give the woman a number more chances of sepsis than she already has. The finger can just as easily clean the uterus as any other instrument, without the possibility of wounding the soft portions of the endometrium, or doing any possible harm. Dr. Price has, in the last two years, seen at least fifty women in the practice of some of the best men in Philadelphia, to whom he was called for the purpose of curetting the uterus for the relief of sepsis; but he has never yet been guilty of using a sharp or dull curet under these circumstances, and never yet has he failed to cure the patient, if she were not already dying.

He referred to the case of a druggist's wife, whom he saw in consultation. Her temperature ranged from 103° to 107°, and yet the woman got well. In another case, in the sister of a physician, the temperature ran for five weeks from 101° to 105°, and this patient also got well. Many cases of this kind die because chemic antiseptics are used and abused in a most criminal manner. Often all that is necessary is to ask the physician to stop his bichlorid injections, and the temperature will drop almost immediately and stay down.

In regard to the ventrofixation craze now

going on, Dr. Price referred to two of the worst cases he had ever seen. One an instance of the strangulation of the bowel from slipping under the haltered uterus, five feet of the ileum becoming gangrenous, and the woman losing her life; in the other case great loops of bowel had slipped through, and death was the result. Any operation that affords a chance for accidents like these has a serious charge against it. Dr. Price maintained further that there is not a single case on record of ventrofixation which could not have been cured by more sensible methods. When the appendages are removed, and the uterus has been fastened between the broad ligaments by two ligatures, it will be maintained in position without further aid. There is no sense in stitching the uterus into a position that it was never intended it should be under any circumstances whatever.

The time will come when the profession will have better surgical teaching on this subject, and that, when a man says he cannot treat retro-displacements without ventrofixation, he will be told to go to some one who will teach him.

DR. GEORGE ERETY SHOEMAKER said that

each man must be the judge of his own results and of his methods of dealing with conditions that he finds. He gets many an opportunity to see the results of others in dispensary and hospital practice, where he meets from day to day the cases that have been operated on by his fellows. Some of those who are most vigorous in their language are among those whose cases thus come for further treatment. As to the matter of ventrofixation, that is an operation which must be tried by history, and that history is forming. It must be judged by statistics only of large numbers of cases. There are cases published, and Dr. Shoemaker has very grateful letters from patients who have been relieved by this operation after years of suffering.

As to the use of the curet after septic miscarriage—that is a question of opinion; it is Dr. Shoemaker's habit to use the finger whenever possible. When he finds a very small uterus that has completely emptied itself, rather than dilate enough to get the finger all the way to the fundus, he uses the dull, narrow forceps of Emmet, or else a wire loop gently, followed by irrigation.

## REPORT OF FOUR CASES OF GLANDULAR FEVER, OCCURRING IN THE SAME FAMILY; ONE AN ADULT.

ALBERT E. ROUSSEL, M.D.

[Read March 24, 1897.]

Since the publication by E. Pfeiffer<sup>1</sup> on the subject of glandular fever various observers have reported cases of this so-called new disease, with, however, such a variance of symptoms as to cause a reasonable doubt of the correctness of their observations or at least to suggest a more careful and detailed study as regards their classification. Pfeiffer's cases occurred in children from five to eight years of age, who had been taken suddenly ill, with a temperature of 103° or 104°, anorexia, occasional vomiting and constipation, and difficulty and pain in deglutition and in movement of the head. Examination showed enlarged and painful glands be-

hind the sterno-mastoid muscle and at the nucha. The duration of the fever varied from two to eight days, but the enlarged glands persisted for some time afterward. The throat was congested, the liver and spleen increased in size. There was no involvement of the axillary or inguinal glands. The same author mentions a less acute form of the disease, characterized by enlarged abdominal glands, diarrhea and rapid emaciation, which certainly offers very much less distinct outlines and indeed questionable connection with the other group.

Stark<sup>2</sup> reports 12 cases in children from

<sup>1</sup> *Jahrb. f. Kinderh.*, 1889.

<sup>2</sup> Ueber Drüsenfieber, *Jahrbuch für Kinderheilkunde*, XXXI, 454.

2 to 8 years of age, with fever, cephalalgia, vomiting, enlarged glands in the neck (but no other glandular involvement), congested throat, anorexia, constipation and an occasional temperature of 104°. Contrary to Pfeiffer, who considers this malady infectious and perhaps contagious, Stark presents the rather questionable hypothesis of an auto-infection of intestinal origin due to the existing constipation.

N. Protassow<sup>3</sup> reports four cases similar to the last mentioned, in boys from 4 to 8 years of age. These four cases were observed in two families, in brothers, and exhibited evidences of contagion. Protassow also quotes Heubner, who among four cases of glandular fever observed two complicated by acute nephritis.

A. Massons<sup>4</sup> reports two cases with but moderate glandular enlargement of the neck, but severe and prolonged general symptoms, together with paroxysmal cough, slight dulness on percussion and respiratory changes in the interscapular region, sweats and fever lasting for more than two weeks, which he attributes to the probable enlargement of the mediastinal glands. It would seem that the symptoms noted could be more easily explained by the existence of a catarrhal pneumonia.

H. Neumann<sup>5</sup> makes mention of 27 cases of glandular fever, but in younger subjects. Eleven were one year of age, or younger, ten between one and two years, and only six between two and four years. Of the total, 19 were in boys. The onset was sudden, and within 24 hours involvement of the glands of neck had taken place, sometimes attaining the size of a goose egg. The other symptoms were about the same as those previously noted, with one important difference, viz., that suppuration necessitating incision of abscess occurred in no less than 13 cases. Besides, we find that in two instances the inflammation of the throat was very severe, and in 10 cases there was otitis media. Examination of the pus in 7 cases demonstrated the presence of the streptococcus

five times, and of the streptococcus associated with the staphylococcus twice. Neumann considers the glandular irritation to be due to the entrance of the streptococcus and looks upon the affection as an epidemic one. We must, however, agree with Comby who, in his analysis of the foregoing, ventures the view that most of the suppurative cases could more properly be left out of this classification.

On the other hand, H. Gourichon<sup>6</sup> finds but one instance of suppuration among 17 cases.

Jules Comby<sup>7</sup> reports 12 cases in children from 15 months to 6 years of age. In all of these cases the glandular enlargement was immaterial, and confined to the angle of the jaw, and in no instance was any other gland of the body involved. Suppuration resulted once. Comby regards the condition as probably due to the entrance of streptococci through the tonsils, which, following the lymphatics, determine the enlargement of the glands supplied by the tonsillar lymphatic vessels. He also admits its probable contagion.

A. Muggia<sup>8</sup> reports four cases. According to his view the disorder is an acute affection of unknown cause, ending in recovery, and likely to be confounded with tuberculous cervical glandular enlargement.

Desplats<sup>9</sup> reports a case in a boy, 18 months of age, followed by death. The patient had but a short time previously suffered in rapid succession from both measles and Rötheln. Subsequently to this a pronounced naso-pharyngeal catarrh developed, and a few days afterwards a rather extensive enlargement of the submaxillary and cervical glands was observed, with fever, constipation, and marked pallor. At about this time a general rubeolous eruption was noticed, which lasted for two days and was attributed to an infectious origin. After about ten days the patient entered upon a rather slow convalescence. A week afterward, however, there was a renewal of fever, of intermittent type, and

<sup>3</sup> Zur Casuistik des "Drüsenfieber," *Jahrbuch für Kinderheilkunde*, XXXI, 363.

<sup>4</sup> De la fièvre ganglionnaire, *Revue des Maladies de l'Enfance*, XI, 241.

<sup>5</sup> *Berliner Klinische Wochenschrift*, 1891, 1227.

<sup>6</sup> *Gazette Hebdomadaire de Médecine et de Chirurgie*, 1896, XLIII, 13.

<sup>7</sup> *La Médecine Infantile*, Jan. 15, 1894, p. 3.

<sup>8</sup> *Gazetta Medica di Torino*, 1893.

<sup>9</sup> *Journal des Sciences Médicales de Lille*, 1894, II, 73.

finally dulness on percussion and respiratory changes, with a fatal result. This would seem to be one of the most questionable of all the doubtful cases reported.

J. Park West<sup>10</sup> reports 96 cases that occurred in eastern Ohio. The ages varied from 7 months to 13 years. The average duration was 16 days; the active symptoms covered from 4 to 7 days. One death resulted, and that in a delicate child convalescent from scarlet fever. In no case was there suppuration of the glands, and no enlargement or induration remained. There were no sequelæ, and no second attacks. Other cases have been reported by C. W. Chapman,<sup>11</sup> by I. Fisher,<sup>12</sup> and by I. E. Sandell.<sup>13</sup>

On the evening of January 20, 1897, I was called to see Sarah B., 5 years old, who had suddenly been taken ill with a vomiting spell. I found the temperature 101°, the pulse 120, and there was headache. The child had previously had chicken-pox and whooping-cough. The tongue was fairly moist and covered with a whitish fur, but with red tip and edges. The mother had observed that the movements of the head seemed restricted and painful, and examination showed a slight but perceptible glandular enlargement, elongated in form, extending downward and forward from the angle of the jaw and behind the sterno-cleido-mastoid muscle on the right side. The overlying skin was not inflamed or adherent. The throat exhibited a rather general redness, more marked about the right tonsil, but no actual swelling or edema. The possibility of scarlatina was mentioned, the other two children isolated, and a trained nurse engaged. Small doses of calomel, as well as half-drop doses of tincture of aconite, were administered.

The patient passed a restless night on the 20th, and the morning temperature was 99.6°, the pulse 110. The evening temperature was 100.8°, the pulse 120. The bowels were still constipated, but there was no further vomiting. More difficulty

was experienced in movement of the head, and the glands were larger—about the size of a hazel-nut. There was no evidence of a rash. The treatment was continued.

My attention was called at this time to the condition of the younger brother, Elmer B., 3 years old, who was decidedly feverish. I found the temperature 102°, the pulse 130. The throat was likewise congested, and there were in addition occasional attacks of dry paroxysmal cough, but with a total absence of physical signs. Constipation was now present, but there was no glandular enlargement. The skin was rather moist, and perspiration had been noticed. The evening temperature was 102.6°, the pulse 135. The child had previously had measles, chicken-pox and whooping-cough. The same treatment was given as in the first case.

On January 22 Sarah B. had a morning temperature of 102.2°, and a pulse of 110. In the evening the pulse was 102°, the pulse 130. The child passed a sleepless night, and the nurse reported excessive perspiration. The movement of the head and the condition of the throat were as before, and the glands were of the same size. Additional glands were not involved. The liver and spleen were of normal size. Examination of the urine yielded negative results. No rash was visible. The bowels were moved once.

Elmer B. had a temperature of 100.4°, and a pulse of 112; an evening temperature of 101.8°, and pulse of 125. The patient was kept awake by frequent coughing spells, but there were no chest-signs. The redness of the throat was more intense, particularly on the right side, and distinct enlargement of the glands was present on the corresponding side in the same locality as in the preceding case. The skin was moist, and the liver and spleen were normal. The urine showed no abnormality.

This condition of affairs continued much the same for eight days in the case of the older child; for ten days in the younger, when the temperature gradually reached the normal. In both instances the patients entered upon a rather tedious convalescence, pale, debilitated and with

<sup>10</sup> An Epidemic of Glandular Fever. *Archives of Pediatrics*, Dec., 1896.

<sup>11</sup> *British Medical Journal*, 1897, 1, 555.

<sup>12</sup> *Lancet*, 1897, 1, 407. <sup>13</sup> *Lancet*, 1897, 1, 433.

a tendency to continued perspiration. In neither case did the temperature reach  $103^{\circ}$ . No other evidence of gland-irritation manifested itself, nor were there any other symptoms of prominence. Under date of February 18 I find that an examination of the blood in the case of Sarah B. showed a corpuscular count of 3,700,000, and a diminution of the hemoglobin to sixty-five per cent. In the case of Elmer B., the count rendered was 4,000,000 and the hemoglobin-estimation seventy per cent. This youngster suffered at this time from a suppurative discharge from the left ear, while, it will be remembered, the involved glands occupied the right side. In neither case are the glands now appreciable.

On January 26, just six days after my first visit to the house, the oldest boy, Joseph B., seven years old, who, as stated, had been isolated from the other children, complained of several attacks of chilliness and had a rather profuse bleeding from the nose during the afternoon. At 6 P. M. I found the temperature to be  $102^{\circ}$ , the pulse  $120^{\circ}$ . The bowels were constipated; there was no vomiting, and the appearance of the tongue, throat and glands was almost an exact reproduction of that in the first two cases, with the exception that the swelling was on the left side. The skin, however, was harsh and dry. The patient had passed through measles, chicken-pox and whooping-cough.

The attack in this case lasted but six days, the temperature gradually reaching the normal on February 1. On one occasion it reached  $103.2^{\circ}$  (and the pulse 135 on the evening of the 28th), and at all times it presented marked morning remissions. On this date there was, perhaps, a slight involvement of the corresponding glands on the opposite side, but certainly not to a marked extent. The bowels were uniformly constipated, the liver and spleen normal, the urine negative. Convalescence was about the same as in the other cases. On February 18 the corpuscular count was 3,900,000, the hemoglobin-estimation sixty-eight per cent. The glands were still somewhat enlarged and tender to the touch.

On January 29 Miss I. N., twenty-four years old, the trained nurse in attendance upon the children, complained of being ill. She had been well from childhood, when she had attacks of scarlet fever, measles and mumps. The throat being complained of, examination showed a general though more intense congestion than in any of the preceding cases, but again no distinct swelling. There was some stiffness of the neck and tenderness over the suspected region on the right side, with doubtful enlargement. The tongue was not much coated, but dry, with enlarged papillæ. The evening temperature was  $102.2^{\circ}$ , the pulse 120. In this instance the fever continued for five days, but at no time did the temperature exceed  $102.4^{\circ}$ . The pulse-rate was again disproportionately rapid, the bowels constipated, the glands on the right side distinctly enlarged, but, perhaps, less so than those of the children. The spleen, the liver, and the urine were normal. The skin was soggy. The feeling of malaise was sufficiently pronounced for the patient to return to her boarding-house and take to bed for the period mentioned. I am not able to state concerning the convalescence, as the patient insisted on a visit to the country and has not since reported to me.

The preceding four cases that occurred under my observation present, it appears to me, some points of particular interest. The fact that they were all in one family would seem to emphasize their infectious or contagious nature, and the case of the adult is but the third that I have been able to find on record, the other two having been reported by Pleiffer and Czajkowski. The other members of the family, three adults, were in no wise affected.

The temperature-ranges of my cases were rather below those mentioned by some of the other observers. On the other hand the pulse-rates were somewhat higher. The glandular swelling was, except perhaps in one instance, unilateral, and was observed within the first thirty-six hours. The surrounding skin was normal, and in no instance did suppuration result. The involvement of glands

in other portions of the body, enlargement of spleen and liver, and the presence of albumin in the urine were conspicuous by their absence.

It would seem from a study of these cases that we are in reality dealing with a group of symptoms in the main sufficiently distinct to merit the designation of a disease. Bacteriologic investigations in this connection have unfortunately been few, but doubtless the exciting agent has entered the system through either the nasal or the tonsillar surfaces, as it is now an accepted fact that microbes can enter through a healthy mucous membrane without leaving traces of their passage.<sup>14</sup>

Czajkowski<sup>15</sup> noted the bacillus of influenza in most of his cases, but it is a notable fact that his observations were made during an extensive epidemic of that disease. Besides, other observers have failed to note this relationship.

Ashby and Wright<sup>16</sup> regard glandular fever as probably infectious and consider that the poison enters through the pharynx without an appreciable lesion at the point of absorption.

The diagnosis offers considerable difficulty. In the cases under my observation I must confess that I was at first strongly inclined to suspect scarlatina or Rötheln. The sudden onset, the rapid pulse, the peculiar coating of the tongue, the congested appearance of the throat, as well as the glandular irritation, were certainly points of strong resemblance.

The non-involvement of the parotid and the other salivary glands is sufficient to differentiate the disease from at least the ordinary form of mumps. Alexander<sup>17</sup> mentions two epidemics, presumably of mumps, in which the glandular swellings were confined exclusively to the sub-auricular and sub-maxillary glands. This form, if it exists, must certainly be rare

and need hardly be taken into consideration. Tuberculous adenitis has been mentioned by Legroux as occurring even in infants as a primary tuberculosis of the glands of the neck; but in these instances we have a continuous and diffuse chain of glands, small, hard to the touch, not inflamed or localized to any particular neighborhood. Gourichon mentions the possibility of confounding the adenitis of puberty, but the glands are larger, not localized, and remain in this condition for an indefinite period of time. Besides, this affects both sexes equally, while glandular fever would seem to have a special predilection for the male sex.

There can hardly exist a difference of opinion regarding the prognosis of glandular fever. In the two fatal cases reported not only is the diagnosis questionable, but they occurred in weak and debilitated persons. Complications would seem to be also rare.

The treatment is necessarily symptomatic. The use of small doses of calomel at the outset has, according to different observers, been of particular benefit. I made use besides of small doses of salophen, which seem to somewhat relieve the pain and general malaise. The administration of iron is certainly necessary during convalescence. Locally, belladonna ointment in conjunction with lanolin was used.

In this connection it is interesting to note that Dr. James Cantlie,<sup>18</sup> in a lecture on the Spread of Plague, mentions that in the year 1891 he reported 23 cases of idiopathic glandular enlargement occurring in children in China in an epidemic form, and that since that date cases have frequently been noticed. Cantlie's description of the disease agrees closely with that of the cases reported in this paper, but no possible relationship can, I think, be made out between Cantlie's earlier cases and the occurrence subsequently of pestis minor, as well as of the true plague.

<sup>14</sup> H. Gourichon, loc. cit.

<sup>15</sup> *Gaz. bek. Warszawa*, 1894, XIV, 787.

<sup>16</sup> *Diseases of Children*, 3rd edition, London, 1896.

<sup>17</sup> *Ref. Hand-Book of the Medical Sciences*, Vol. VIII, p. 834.

<sup>18</sup> *Lancet*, Jan. 2, 1897, p. 6.

## DISCUSSION.

Dr. J. C. WILSON, from a somewhat hurried consideration of the accessible literature upon the subject, recommended deliberation in accepting in glandular fever a new nosologic entity, and yet there seems to be a good deal to bear out the suggestion that the cases reported by various observers are examples of a specific infectious process, as is indicated by the conclusions of Dr. Roussel.

In several of the recorded instances there has seemed to be some association between glandular fever and scarlatina.

Dr. Wilson referred to a case, encountered in private practice five or six years ago, that seems to have some bearing upon the matter under consideration.

A lady, thirty-four years of age, the mother of four children, was taken sick suddenly with an erythematous angina, the temperature reaching 104° F., and fluctuating between 102° F. and 104° F. for a period of five or six days. She had suffered from scarlet fever in her childhood. In the attack referred to the lymphatic glands on the side of the neck, both the chains in front and behind the sterno-cleido-mastoid muscle, the axillary glands, those upon both sides of the thorax and the inguinal glands were decidedly enlarged. The fever gradually declined and came to an end in about a week. The urine during the attack and throughout the convalescence remained free from albumin. The spleen was not enlarged; the area of liver-dulness was normal; there was no abdominal tenderness. The swelling of the glands declined only slowly during a period of several weeks. Just as the patient was recovering from this attack two of her children developed scarlatina, and the third child fell ill of it seven or eight days later. It seems that this case has some significance as bearing upon the possible association between the acute febrile process in which the superficial lymphatic glands are involved, now attracting so much attention, and scarlet fever.

Dr. J. M. ANDERS submitted the following statement: The fact that all of Dr. Roussel's cases occurred in the same household points strongly to the infectious character of gland-fever. Pfeiffer, who first described the affection in 1889, called attention to the fact that several members of the same family are likely to be affected. In the cases reported by other observers the fauces showed congestion, and hence it is quite probable that this is the common seat of invasion. It has been generally supposed that the affection occurs only in subjects under ten years, but one of Dr. Roussel's patient's being an adult, it may be shown by future observers that all ages are, in some degree at least, susceptible.

I have seen but a single instance that I regarded as one of gland-fever. It occurred in a female six years of age. There was a family history of tuberculosis, but the child had never manifested evidences of tuberculous infiltration anywhere in the body. The tonsils had been for a couple of years enlarged. A history of a slight general indisposition during the week preceding the date of onset of the gland fever was obtained. The onset of the attack was rapid, with fever; the fauces were congested, and the glands in the anterior and posterior cervical triangles were enlarged. Prostration was not marked, but the child was kept in bed. The fever was of continuous type, and at the end of eight days declined by rapid lysis. The largest glands attained to the size of a walnut, were painful and quite sensitive on palpation. The condition was bilateral, and no tendency to suppuration or fusion of the glands was manifested. With the decline of the fever rapid improvement in the general condition ensued. The glands rapidly diminished in size, and at the end of another week all enlargement had disappeared.

The diagnosis of acute primary febrile adenitis, in its purest and most typical form, presents few difficulties. From the fact that the chief seat of enlargement may be immediately beneath and posterior to the lobe of the ear, mumps is often suggested. In acute febrile adenitis, however, a number of glands, all of which remain separate and somewhat movable, can be palpated. In both diphtheria and the anginose form of scarlatina the sub-maxillary glands are chiefly involved, and inspection of the mouth and throat furnishes important indications.

I recall an instance of acute Hodgkin's disease in a child, in which the posterior cervical lymph-glands rapidly enlarged. Irregular fever was early associated, and by the end of one week the temperature had risen to 103° F., and a fatal termination was reached by the end of the eighth week. Cases like this may, for a time, bear a close resemblance to those of acute febrile adenitis. The course of acute Hodgkin's disease is longer—from two to four months generally—than that of acute febrile adenitis, which lasts only from one to two weeks. The latter disease invariably ends in recovery, while acute pseudo-leukemia as uniformly ends fatally. It should also be pointed out that even in acute cases of Hodgkin's disease fusion of the affected glands occurs.

Dr. A. ROUSSEL said in connection with the possibility of scarlet fever, that Dr. Park West, in his report of 96 cases, makes mention of several cases of glandular fever, so-called, that occurred shortly after scarlet fever.

Dr. H. A. Hare presented

# A CASE EXHIBITING GREAT GOUTY DEFORMITY.

The patient was a man about 45 years old, who entered Jefferson Hospital some weeks before with gouty deposits in his fingers, producing the characteristic gouty deformity with sodium urate about his joints and sinews. There are several points of interest in his case, aside from the fact that such profuse deposition of sodium urate is rarely seen in this country as in this man. Of interest is the fact that soon after admission he was given treatment by the Tallerman-Sheffield hot-air apparatus, and within twenty-four or forty-eight hours of the first or second treatment there occurred a widespread multiple gouty attack—that is a violent attack of inflammation ensued involving the knees, ankles and wrists, in fact all of the joints, and this outbreak was much more severe than any previous attack.

It is possible that the exposure to heat of such intense degree caused absorption of the

sodium urate, which resulted in a gouty storm in other joints of his body. The patient had since had almost every day the Tallerman-Sheffield hot-air treatment, the temperature reaching 310° F., which is 40° or 50° higher than seems to have been employed in any other case.

The result of this treatment has been very satisfactory and, as the man expresses it, his fingers feel more like "flesh;" the nodules are not nearly so hard and they are red, not an acute inflammatory gouty redness, however. In the gouty nodules softening seemed to be taking place, with absorption of the masses, and the movements of the fingers were better.

At the time of his entrance into the Hospital Dr. Coplin took a skiagraph of his hand, which is interesting because it fails to reveal the sodium urate nodules, the rays seeming to have passed through this substance as they passed through the connective tissue of the hand; so that while the outline of the hand is present in the Röntgen picture the nodules are not shown at all or in only one or two places. The man is not an Englishman, but a native of Rhode Island.

## THE USE OF INTRAVENOUS SALINE INJECTIONS FOR THE PURPOSE OF WASHING THE BLOOD.

H. A. HARE, M. D.

[Read March 24. 1897.]

I desire to call the attention of the society to-night to the use of intravenous injections of saline fluid for the relief of threatened or present toxemia arising from renal disease, diabetes, or any acute infection, whether due to the specific micro-organisms which cause the eruptive or other fevers, or to septic infection. My own experience is limited to its use in uremia and in toxemia associated with gangrene.

The use of intravenous injections for the relief of the collapse following severe hemorrhage or injuries, is too well recognized as a valuable remedial measure to need any attention at this time. Surgeons resort to it or to hypodermoclysis, or the injection of saline fluid beneath the skin, quite frequently, and these means of resus-

citation have practically displaced the obsolete practice of transfusion of blood or of milk. I believe that both plans are resorted to less frequently than is well, particularly the intravenous injections. The fear of air-embolism restrains some, I think needlessly, and the opening of a vein is as timorously performed now as it was boldly done sixty years ago.

The use of intravenous injections for the purpose of washing the blood is, however, an entirely different matter, one of very much more recent employment, and exceedingly popular with physicians on the European continent, particularly in France. Within the last year almost every French journal has contained accounts of cases of toxemia treated with more or less success in this manner, and



the results have certainly been such as to deserve wide trial and careful study. It is now a number of years since Stadelmann proposed and used the intravenous injection of sodium carbonate for the relief of diabetic coma. This proposition, however, rested upon quite a different basis from that I am now discussing, namely, to antagonize chemically the acid which he believed to be in the blood as the cause of the diabetic coma. We now know that little, if any, permanent benefit results from such treatment, but that temporary improvement sometimes occurs. Thus Von Noorden speaks in glowing terms of one case of this character in which very good results ensued. Whether the good results that have been recorded resulted from the chemic effect, or from washing the blood of impurities, is doubtful, but I am inclined to believe that the fluid entering the vein is responsible.

Before stating my own cases I shall cite a few illustrative cases from French and German sources:

Maygrier, apropos of a case of placenta prævia successfully treated by three intravenous injections (amounting to six liters) in one evening, says the reservoir of the solution is placed from half a meter to a meter above the vein, and all air is carefully expelled from the tube and needle before the latter is introduced. Should the reservoir be lowered by mistake, blood may enter the cannula, clot there, and a clot be injected when the reservoir is raised. If any blood enter the cannula the instrument must be withdrawn and emptied, and the operation recommenced. The entrance of a small quantity of air does not matter.

Lejars exhibited a young man whose ruptured intestines he had sutured after peritonitis was fully established, and who recovered after receiving twenty-six liters of saline solution in intravenous injections; and gave details of three other remarkable cases of surgical infection cured in a similar way. He said that, always providing the kidneys are sound, such injections even in desperate cases may be attended with unhopèd-for success, and should be gener-

ally adopted. Grave and threatening infection may be arrested or attenuated by one large injection, but it will generally be necessary to continue the lavage for some days, to use many liters of artificial serum, and to supplement the intravenous injections by hypodermic injections of moderate quantity every two hours.

Chasserany reported that he had found by experiment that voluminous injections (intravenous, intraperitoneal, or subcutaneous) prevent the intoxication of rabbits by strychnin, provided they are made before the onset of the nervous symptoms, but Delbet was not able to detect the alkaloid in the urine or saliva of dogs poisoned by strychnin, and in one case only of eight was the effect of the poison modified by the injections. A dog of forty-three kilos received three milligrams of strychnin sulphate; then, in eighty-five minutes, 910 milligrams of the saline solution; all symptoms ceased and the animal recovered. In 105 minutes from the beginning of the injection the enormous quantity of 532 grams of urine had been passed. The animal was killed some days later by the same dose of the poison in twenty-one minutes. Further experiments proved that the injection of even large quantities of the saline solution did not cause trouble when the arterial pressure was normal, or even when it was artificially raised by atropin; this method may therefore be employed in certain pathologic elevations of pressure—for example, eclampsia. Pressure lowered by copious hemorrhage is rapidly restored by the injection of even a less bulk than the blood lost, but not so rapidly by the hypodermic as by the intravenous method.

Tuffier has practiced intravenous injections, both for hemorrhage and for toxemia, in fifty cases, including two cases of tetanus (after preliminary bleeding), and found that the first effect was to restore the normal arterial pressure and diminish the frequency of the heart's action; the second, to cause diuresis.

Proben, in a case of eclampsia, injected two quarts of normal saline solution; the urine had been almost totally suppressed,

with 100 per cent. of albumin, but within twenty-four hours the woman passed 109 ounces.

Berlin reported to the Société de Chirurgie the case of a woman who, three days after vaginal hysterectomy, manifested such violent symptoms of sepsis that recovery seemed absolutely impossible. The belly was distended and painful, and there was very marked subnormal temperature and frequent vomiting. On the fourth day the patient seemed to be about dying, whereupon Berlin gave an intravenous injection of a little over a pint of artificial blood-serum, and shortly afterward repeated this injection, using not quite two pints. Marked cyanosis and increased gravity of symptoms followed at once, but shortly there was decided improvement and the patient recovered, being completely convalescent by the twelfth day of her illness.

Segond stated that he had used injections of artificial serum for four years in all major operations, and had been able to save many cases of severe hemorrhage by this means. He also stated that in cases of severe sepsis these injections were potent.

Michaud<sup>1</sup> details fifteen cases in which this treatment was adopted, all with septic peritonitis following operation. Of these, five recovered. In one case, the patient being in imminent danger, 1000 grams of artificial serum at 39° C. were injected, causing an immediate rise of the temperature of four degrees, and a slowing of the pulse. The serum was used during three days, at the end of which time the patient was out of danger, and recovered. A similar result was obtained after ablation of the Fallopian tubes, several injections being used, together with irrigation of the peritoneum. The artificial serum of Hayem, or simply sterilized saline water, was used. Various accidents were noted—vomiting, pain in the side, plethora, and disturbance of the cerebral circulation. No later complications were observed. The method is excellent, but other means—drainage, irrigation, re-opening of the abdominal incision, and the free local application of ice

—are to be used concurrently. Monod has had seven similar cases, with three recoveries. The effects were beneficial, even in the cases that ultimately terminated fatally.

Bovet and Huchard<sup>2</sup> first review the literature as to the employment of subcutaneous injections for toxemia, and then report an interesting case of pyelonephritis occurring in a married woman who had been a sufferer for a long time from a mild albuminuria. The patient became seriously ill from general toxemia; fever developed, the urine became scanty and albuminous, the tongue was dry, and a large number of casts were found in the urine. The pulse rose to 130; the respirations to 28. Under these circumstances it was considered wise to inject a considerable quantity of normal salt-solution.

Between April 20 and October 15 the patient received injections subcutaneously twenty-five times and by the rectum about twenty times. The quantities injected under the skin varied from three ounces to two quarts a day, and the urine increased correspondingly with each large injection.

A second case is reported in which there was uremia with general anasarca. As a result of this treatment the conclusion is reached that hypodermoclysis is an exceedingly valuable procedure.

Usually as the injection is given the patient at once shows signs of improvement, but in from two to thirty minutes he develops a severe rigor, with a strong, rapid pulse, followed in half an hour by great flushing of the skin and then profuse sweating, with greatly increased urinary secretion. Sometimes quite a marked febrile movement takes place. Several hours afterward the patient reports himself as greatly improved.

My own cases are as follows:

A man of sixty-odd years developed acute toxemia, with high fever and coma, owing to the sudden extension up the leg of gangrene of the toes. At first he could only be roused by speaking sharply to him; later he became still more comatose.

<sup>1</sup> *Le Progrès Médical*, No. 2, 1896.

<sup>2</sup> *Journal des Praticiens*, January 23, 1897.

His muscles became spastic. Twelve hours after the onset of the toxemia I injected about one quart of warm normal saline solution into a vein of the arm in the course of an hour. The man developed a severe rigor, then broke out in a profuse sweat, and next morning, ten hours afterward, was perfectly conscious, said he felt first-rate, but later in the day became comatose again and died. He was doomed from the first because of his gangrene.

The second case is that of a man with chronic parenchymatous nephritis, who came into the hospital with twitching of his muscles and semi-comatose. He had passed scarcely any water for several days. He had had constant headache for six months and was markedly edematous from head to foot. He was too weak to be bled, or to be purged, or to receive pilocarpin, and seemed too ill for a sweat from a hot pack. I injected one quart of hot saline solution into a vein of his arm. He also had a mild rigor followed by a sweat, and in three hours thirteen ounces of urine were obtained from his bladder. The next day he said he had no headache, no dizziness, no pain anywhere, and felt no discomfort. His dropsy was not increased. Ten days later, as his uremic condition seemed to be returning, I repeated the injection, with similar results.

The apparatus which I use is constructed as follows, and embodies all that is necessary for the treatment of these cases:

A glass container such as is used for irrigation-purposes in antiseptic surgery is set in a frame in order that it may stand on a table rather than be hung against the wall. To the bottom of this container is attached four or five feet of red Para rubber hose, and in the end of this rubber hose is inserted a plain glass cannula; a clip is placed upon the hose in order that the flow may be controlled, and the cannula, with the tube that has been attached to the blood-vessel, joined to the tube running from the irrigator at the moment when they are both completely filled with liquid, so that no globule of air will be contained in the tube.

We may next consider the best fluid to use. The following statement by Edes<sup>3</sup> embodies my views exactly. I shall hereafter use the formula described, although in the cases just detailed I had to use ordinary saline solution instead. According to Edes:

"A modification of Ringer's fluid has been in constant use in the Massachusetts General Hospital for about two years. The formula is 0.1 gram  $\text{CaCl}_2$ , 0.75 gram  $\text{KCl}$  to 1000 cu. cm. normal salt-solution. This fluid has been used chiefly for intravenous infusion, by means of a cannula, in quantities of from 500 to 200 cu. cm. Its use in the Massachusetts General Hospital started from a suggestion made to the writer in 1894 by Dr. William H. Howell, formerly Assistant Professor of Physiology in the Harvard Medical School, who was then repeating some experiments of Sydney Ringer. One set of these experiments showed that calcium salts are essential to the clotting of blood. Another set consisted in passing different fluids through an isolated heart (frog's), and observing the character of the beats and the length of time the beating was sustained by such fluid. Blood-serum sustains the beats well and for a long time. A solution of the albumins of the serum without salts does not sustain the beats well, nor does a simple normal salt-solution. The addition of a calcium salt alone to the salt-solution causes strong beats, which, however, are too prolonged, and therefore inefficient. The addition of a small amount of potassium chlorid corrects the character of the beat, and this combination, normal salt-solution plus calcium plus potassium, will sustain heart-beats as well and as long as blood-serum.

"The idea lay very near to supply such a fluid to the circulation in cases of extensive hemorrhage, in place of using simple salt solution, which, experimentally at least, does not sustain the heart so well. Ringer's fluid is 100 cu. cm. of a .75-per-cent. solution of sodium chlorid saturated with calcium phosphate, adding 1 cu. cm.

<sup>3</sup> *Boston Medical and Surgical Journal*, March 3, 1897.

of a two-per-cent. solution of potassium chlorid. This is not convenient for use in surgery, however, because the boiling necessary for sterilization precipitates a phosphate of calcium. This might possibly be evaded by sterilizing the ingredients, but in the Massachusetts General Hospital it was found more convenient to use the soluble chlorid of calcium. The fluid can be made up in Florence flasks, which can be boiled and the fluid kept sterilized for accident work, and warmed for use by placing in a pail of hot water.

"The difficulty of comparing the action of Ringer's fluid with that of salt-solution is extreme, as the cases where either is used show such tremendous variations in prognosis independent of any treatment.

"It seemed to the author when he first used the fluid intravenously in accident cases in the winter of 1894-95, that the effect was more permanent than that of salt solution. Two or three remarkable recoveries from hemorrhage and from

shock have occurred with, and possibly because of, its use. It is possible that a modification like that of Dr. Locke, containing 0.3 gram calcium chlorid to the liter instead of 0.1 gram, as used in the Massachusetts General Hospital, is more advantageous; and again it is possible that one percentage may prove better adapted for intravenous use and another for rectal. It is much to be desired that Ringer's fluid should receive an extensive trial, and if possible in such a way that its value compared to that of simple salt solution may be estimated."

I wish in conclusion to strongly urge the use of this method of treatment in the toxemias I have named. I am confident it is well worthy of wide application, and while not a serious operation it offers probably the only chance for a series of conditions almost always fatal. The recovery of a clear mind, and the setting aside of oncoming coma, are only to be seen to have this method appreciated.

## DISCUSSION.

DR. JAMES TYSON said that he had used hypodermoclysis in the treatment of diabetic coma and also in that of puerperal nephritis when there was no dropsy. He has had the same experience as others with its use in the treatment of diabetic coma, almost startling results in the way of improvement in the condition of the patient, but no permanent benefit. In one case of puerperal nephritis in which this measure was used at the University Hospital in a case of supposed uremia ultimate recovery resulted.

DR. GEORGE I. MCKELWAY said that some Continental operator has lately been insisting that he gets better results when, in operating on pus-cases, instead of wiping out the pelvis

without irrigation or drainage, he washes out the abdomen with large amounts of saline solution, and then, being careful to leave the abdominal cavity as full as may be of this saline solution, he reverses the patient's position sufficiently to distribute the fluid throughout the whole of the abdominal cavity, around the liver, the spleen, the intestines, and the diaphragm. His thought is, that in doing this, he is so diluting any septic material that may be there, that the peritoneum will take care of it without difficulty because of the dilution.

To Dr. McKelway it seemed that some of the good results this operator claims may be due to the absorption of the saline fluid, and its action precisely as it does act when injected into the vein or by hypodermoclysis.

## TESTS FOR VISUAL MALINGERING AND HYSTERICAL BLINDNESS.

EDWARD JACKSON, A.M., M.D.

[Read March 24, 1897.]

We have no test that distinguishes between impairment of vision due to hysteria and that simulated in malingering. It seems clear that hysteria is a true pathologic condition, as real as any pathologic condition that we are called upon to treat; but, because of its peculiar character and its independence of recognizable anatomic changes, it is impossible by any single test to certainly distinguish it from malingering.

There are some symptoms of hysteria, especially such as the alterations in the visual fields, which are of a character not likely to be simulated by the malingerer. But when it comes to symptoms that are likely to be feigned, our tests do not discriminate between the disease, hysteria, and voluntary feigning. Hence the tests that I am about to refer to generally reveal that the condition present is or is not either hysterical or feigned, but other symptoms and the general aspect and surroundings of the case must be considered before determining which of these is the condition present. Tests of the field of vision may throw important light upon this question, as the hysterical field usually exhibits certain distinct characteristics, while feigned impairment of the visual fields is likely to follow closely one of the common forms of hemianopsia, or to promptly show the fraud by incongruous or impossible symptoms. Further than this I do not propose to refer to tests for the field of vision, but simply to speak of the tests for acuteness of vision at the center of the field, vision as commonly taken with test-letters.

In my experience, feigning most frequently takes the form of exaggeration of an actually existing visual defect; or of ascribing a defect previously existing to some particular cause or accident. It is

quite possible that this latter may be done quite honestly, without the slightest intention to deceive, as defective vision in one eye may exist many years without being noticed.

To avoid falling into error by accepting as correct a statement that under-estimates the acuteness of vision actually present is by no means easy. A large proportion of patients will stop reading and say they cannot see any more; yet with a little coaxing they can be induced to read one or two additional lines of smaller test-letters. Simple disinclination to make the effort to observe closely prevents them from revealing their true visual acuteness; and when to this is added the desire to make as much of a disability as possible, the obstacle may become insurmountable. However, tact and patience will do much.

One plan for overcoming reluctance to reveal the full acuteness of vision, is to use a card having several lines of letters too small to be read at the distance at which it is placed. Then giving the claimant the impression that he is expected to see all of these, he will feel gratified to find that he actually cannot do this, and gratitude for this supposed demonstration of a desired impairment of vision may incline him to co-operate heartily in the test, and read the lines that should really be just visible to the normal eye at the given distance. Even the malingerer feels that the truth is the safest thing, if he thinks it will answer his purpose.

A popular impression that is valuable in this connection is that glasses help all kinds of defective sight; and that the exhibition of normal acuteness of vision with a glass will not impair the claim for impairment of vision from disease or injury. By very careful objective determination of the correcting lenses (and for this purpose

skiascopy is the only practical method), and the placing of them before the eyes, if vision is at all improved by them, it is very often possible to secure the patient's co-operation to such an extent as to demonstrate his full visual power. This plan has, in my hands, proved very effective in the examination of claimants for pensions. These claimants believe they are entitled to pensions, at least as much entitled to them as others who receive them; and they have all lost their power of accommodation, and (emmetropia being very rare) they all, without correcting lenses, have imperfect vision. To attempt to ascertain the correcting lenses by the subjective method is simply a waste of time, and a source of vexation and irritation. But if the correcting lens is accurately determined objectively and placed before the eye, the claimant will, almost invariably, co-operate and reveal the full acuteness of vision he possesses. Over and over again I have thus been able to demonstrate vision better than with the Snellen normal standard, in those claiming pensions on the ground of visual impairment.

When *blindness of one eye* is feigned, well-known tests readily reveal it. The best of these are the diplopia test and Harlan's test. The placing before the seeing eye of a prism too strong to be "overcome," by displacing the retinal image, causes binocular double vision, if the image is still seen in the normal position by the eye falsely claimed to be blind. This test may be rendered most effective by first holding a prism before the seeing eye in such a way that its edge shall come before the pupil, thus causing monocular diplopia by the formation in the one eye of two images, one from rays passing through the prism, and the other from rays passing beside it. Or one may take the double prism, and, holding it with the line of junction in front of the pupil, get the same monocular diplopia. Having thus demonstrated to the claimant that he sees double with the seeing eye alone, we proceed to ask about the position of the images when the prism is held in different directions; and then slip the prism com-

pletely in front of the pupil, so that in one eye rays all unite to form a single image, and diplopia remaining becomes positive evidence of binocular vision.

The other standard test, proposed by our fellow-member, Dr. George C. Harlan, consists in placing before the alleged blind eye a plane glass or its correcting lens (the latter often perceptibly improving its vision), and before the "seeing" eye a strong spherical lens, either convex or concave, which will entirely prevent clear vision at the distance of the test-letters. The claimant is told to keep both eyes open and read what he can through the glasses; and commonly he does so, supposing that he does it with his "seeing" eye, which has been excluded. This test is particularly valuable because of its simplicity, which allows of its ready explanation before a jury, and because the claimant can himself be convinced that his fraud is fully detected, by asking him to read the same letters after the hand has covered what he claimed to be his blind eye. More than one suit for damages has thus been brought to an abrupt termination.

Another test for feigned monocular blindness, but of less practical value, may be arranged with cylindric lenses, obliquely placed before the eyes. Viewed through them, a plain rectangular surface appears distorted with either monocular or binocular vision, but the distortion is quite different in the one case from that which occurs in the other, and it is sufficiently characteristic to reveal with certainty whether monocular or binocular vision is implied. This test is more appropriate for cases in which pretended impairment of vision is comparatively slight.

*Feigned blindness of both eyes* has heretofore been regarded as more difficult to detect than feigned monocular blindness. Thus de Schweinitz, "Diseases of the Eye" (Second Edition, p. 488), states: "If a malingerer claims to be blind in both eyes, he can be detected only by placing a careful watch over him." Noyes, "Diseases of the Eye" (Second Edition, p. 720), says: "It is difficult to unmask the pretense of total blindness. One must have

opportunity to watch the person without his knowledge." Fuchs, "Diseases of the Eye" (American Edition, p. 29), suggests observation of the pupillary reflex: "Although there are rare cases in which in the presence of actual blindness the pupillary reflex for light is still retained."<sup>1</sup> Fuchs also mentions the Schmidt-Rimpler method of telling the claimant to look at his own hand, which the blind man does without hesitation, while "a malingerer will perhaps purposely look in the wrong direction." Occasionally the malingerer can be startled into betrayal of the fraud. I once heard Dr. William Osler tell of a young woman who made the round of the London hospitals claiming complete blindness without apparent cause. Being led into the Moorfield's Hospital, an assistant suddenly held a live frog before her eyes and she ran out screaming.

Priestley Smith has recently given us a most perfect method of recognizing feigned blindness, although he has done it in such a modest, matter-of-course way that it has not yet attracted the attention it deserves. In the Ingleby Lectures on "The Mechanism of Binocular Vision, and the Causes of Strabismus,"<sup>2</sup> to illustrate the subject of diplopia in connection with strabismus in children, he narrates the following case:

"A few months ago a prisoner, awaiting trial for burglary with violence, awoke one morning blind in both eyes, so he said. The prison surgeon had no doubt that he was shamming, but wanted positive evidence one way or the other, and we examined him together. The man declared himself to be quite dark in both eyes, and acted the part of a blind man fairly well, overdoing it a little. The pupils were already under atropin, and could therefore give no evidence as to the light reflex. A lighted candle was placed before him in a dark room. He was not required to 'look' at the candle, being nominally blind, but the candle was placed

about where he appeared to be looking. A prism was then placed before one eye, its base inwards; instantly the eye moved outwards. The prism was removed, and the eye moved inwards. The man was told that his blindness would certainly disappear as quickly as it came, and he probably understood that the fraud would get him into more trouble if persevered in. His sight was soon restored. Now if this man could have carried his blindness into the dock, a merciful judge and jury would not improbably have felt that a higher tribunal had already visited him with a heavy punishment, or at least that he was incapacitated for further crime, and would have dealt with him very leniently. As a matter of fact he was a particularly daring and dangerous criminal, and had during a previous imprisonment attempted the life of the prison surgeon. He received a long sentence."

This method is so perfectly simple and reasonable that it seems remarkable that it should not have been thought of before. Doubtless, it would have been sooner brought into use if the feigning of binocular blindness were not comparatively rare. I have tried it a number of times, not on any case of feigned binocular blindness, as none has been encountered, but upon eyes actually blind; and upon those with seeing eyes who, understanding the test, attempted to defeat it by not turning the eye before which the prism was placed. It is a test that may be relied on to reveal feigning of binocular blindness in all cases, except those in which along with blindness there is pretended an inability to keep the eyes open, or constant movement of the eyes, nystagmus.

The best prism is generally one of 6° or 8°, held with its base towards the temple. Most persons involuntarily "overcome" such a prism by turning the eye correspondingly toward the nose, to escape diplopia, even in spite of an effort not to do so. It would be possible, of course, for a special case of heterophoria not to show the characteristic movement with this particular prism, but a trial of other prisms, or of the same prism with its base

<sup>1</sup> Harlan has shown that some light-reflex is often retained in blind eyes. *Trans. Amer. Ophthalmol. Society*, 1896.

<sup>2</sup> *British Medical Journal*, June 20, 1896.

turned in the opposite direction, should reveal this characteristic movement. When the attempt is made to prevent such movement, to ignore the double images, the movement of deviation may be so gradual or so delayed as to escape detection, when the prism is placed before the eye; but on removal of the prism the "recovery" is prompt and characteristic. The same test may be applied for the detection of feigned monocular blindness. The prism held before the seeing eye causes the characteristic movement, but before a blind eye it causes none. It is a test that reveals not merely some light-perception, but the presence of a compar-

atively definite and clear perception of objects.

When the malingerer feigns not only binocular blindness, but also nystagmus and an inability to open the eyes, he may be placed under the influence of a general anesthetic and tested and watched during the period of recovery, when he will most certainly fail to sustain the fraud.

By the methods thus briefly reviewed, I believe it to be possible in all cases to detect feigned blindness; but the distinction between malingering and hysterical blindness has to be based on other evidence, and cannot be determined simply from the results of these tests.

## DISCUSSION.

DR. GEO. C. HARLAN said that exaggeration of actual defects of vision has not been so frequent in his experience as it appears to have been in Dr. Jackson's, though he has met with it in some cases, usually in applicants for pension. The attention given to a slight conjunctivitis, or an injury—the fuss made over it, and the sympathy excited by it—has sometimes been the starting-point of the simulation of blindness. It has acted as "suggestion." In one case it seemed probable that the fact that the patient's mother had one blind eye, which had frequently been a subject of discussion in the family circle, suggested the complaint.

Of quite a number of cases of hysterical blindness that Dr. Harlan has met with, all have been monocular. The binocular form involves such grave inconveniences that it is very rare. In an earlier paper by Dr. Harlan, on the subject, published many years ago, a case is fully and carefully reported by the late Dr. D. H. Agnew, and it was learned accidentally, from a former medical attendant, that one of Dr. Harlan's monocular cases had had a binocular attack a long time before.

The distinction between pretended and hysterical blindness may be a just one, but it will often be found very difficult of establishment in actual practice. It has seemed to Dr. Harlan that these mysterious cases might be divided into two more or less distinct classes, which, in a paper read before the Philadelphia Neurological Society some ten or twelve years ago, he attempted to sketch, as follows:

"These cases of hysterical blindness offer a curious and most interesting psychological problem. In some there is evidently a more or less deliberate deception, the result of an insane craving for sympathy or personal import-

ance, or the motiveless freak of a disordered mind. Patients of this class are like the fastidious girls, who develop a superhuman ingenuity in the effort to make it appear that they live without eating." That is really a kind of insanity—"ganglionic insanity," if one chooses, as hysteria has been called. On the other hand, it is possible that the physician may sometimes have to deal with simple vulgar deception, without even the glamor of insanity. It is well known how difficult it often is to draw the line between irresponsible insanity and what may be called, in Western vernacular, "pure cussedness," and to determine whether a given case should appeal to one's pity, or only deserves one's anger. Perhaps the easiest way out of the difficulty is to generalize with those authorities who claim that all scamps are lunatics.

As to the other class: "In the case of others, however, the charge of intentional deception can by no means be so easily maintained. Indeed, a careful consideration of their other symptoms, their surroundings, and their previous good character, is almost enough to acquit them of acting a part. I have sometimes suspected that, though they read well enough unconsciously, they might not be capable of conscious vision with the affected eye; that there might be some mysterious derangement of the process of perception—a kind of negative hallucination, if such an expression could be allowed."

Since writing the foregoing, Dr. Harlan has met with a case\* that seemed to speak strongly in favor of the existence of this class of honest simulators, who really believe themselves to be

\*Trans. American Ophthalmological Society, 1889.



affected, as they profess to be, and are even anxious to be cured. The patient, in this case, seemed ready to undergo martyrdom, in testimony of the faith that was in him. He was a male—for though men never have a uterus, it can scarcely be denied that they do sometimes have what, for want of a better term, is called hysteria. When twelve years of age, he was struck on the eye with a stone, thrown by another boy. There was a loss of sight, with pain and inflammation, and he was placed in charge of one of the best-known ophthalmic surgeons of the time, who, after treating him for several months, sent him home as hopelessly blind from paralysis of the optic nerve. The eye was a source of great anxiety to the boy's parents, and interfered seriously with his education. Ten years later, having been in the meantime absolutely blind of that eye, while employed as a clerk, he suffered from asthenopia, which Dr. Harlan found to be due to latent hypermetropia, and the family physician, who had heard that a blind eye sometimes affected the other, thought it might be necessary to remove it to save him from complete blindness. Under these circumstances the boy came to Philadelphia, ready to have the eye enucleated, if this should be decided to be necessary. Dr. Harlan could find nothing the matter with it, and was completely puzzled, as the idea that he had suffered a supposititious blindness for ten years seemed too absurd to be entertained. At the next visit, however, the prompt action of the pupil, which should have put him on the right track at once, having excited his suspicion, Dr. Harlan tried the prism test, and the two images were acknowledged. Then with the lens test, the boy read Snellen 25 at twenty feet with the blind eye, without hesitation. When the good eye was now closed and he had been shown what he had been doing, he professed great joy and hurried to the telegraph office to notify his friends at home of the miracle that had been performed. With the correction of his hypermetropia he had no trouble afterwards. This case seemed to speak strongly in favor of the existence of the second class. There is still the possibility, however, that it may have belonged to the first—that the patient may have been simply a malingerer, and finding himself hopelessly convicted, may have thrown up the sponge. If so, he acted his part well enough to convince Dr. Harlan that he would have been allowed to enucleate the eye.

A great difficulty with tests for simulated blindness is that they are of necessity in great part subjective, and therefore often resolve themselves into a contest of ingenuity and astuteness between the patient and the surgeon. Among subjective tests Dr. Harlan has not yet found that with the strong lens before the good eye, and the weak one, or the plain glass, before the other, to fail him, though it might easily do so in the case of a quick-witted and experienced subject, who would be likely to take the precaution to close one eye before

giving his answer. It is important for the surgeon to have command of as great a number and variety of tests as possible. In the case of binocular blindness Dr. Harlan would be disposed to try etherization, with the hope that in the state of intoxication that precedes and follows complete insensibility he might find in *cæthere veritas*. The late Dr. Hutchinson made the diagnosis, and at the same time effected the cure, of a case of hysterical deaf-dumbness in this way. For objective testing one is confined to the use of the ophthalmoscope and observation of the movements of the eyes behind prisms and the action of the pupil, and when absolute blindness, particularly of one eye only, is claimed, the result of these examinations may be considered practically conclusive—that is, they prove that there is no real blindness from organic cause, though they do not prove that vision may not be more or less impaired; so that the most difficult cases to deal with are those in which actual defects are exaggerated. Absence of light-perception is probably never found in connection with a perfectly normal fundus, and if, in addition to this, there is prompt and full pupillary reflex, the seeing eye being covered in monocular cases, Dr. Harlan believes one may be absolutely sure that there is deception or hallucination in the case. Though it is possible for cortical blindness to occur from a cause located beyond the pupillary reflex path, a double lesion would be required to produce complete blindness, even in one eye, and such extensive disease would be manifest enough to remove the case from the category of doubt. The converse is not necessarily true, i. e., that a fixed and dilated pupil is proof of serious impairment of vision—for an irritation-mydriasis, the result of excitation of the pupil-dilating center, which is known to be influenced by the emotions, is sometimes met with in hysteria. The pupils are usually enlarged and fixed during hysterical convulsions.

DR. G. E. DE SCHWEINITZ agreed that it is impossible by visual tests alone to positively differentiate between hysterical and simulated blindness, although he had no doubt that in most instances the hysterical nature of the affection could be established by associated symptoms, particularly by the search for other hysterical stigmata. In support of this, he related two cases of hysterical blindness in which, although the amblyopia appeared to be genuinely hysterical, the ordinary tests employed for detecting simulated amblyopia proved that the patient saw with both eyes. He quoted Dr. F. X. Dercum's conception of hysterical amblyopia, as follows: "In looking through a microscope the instrument is used with both eyes open, and yet we see only with the eye applied to the microscope. The disengaged eye is for the time being psychically blind, and yet physically it is not blind. We see with the disengaged eye, and yet we do not see. The truth of this paradox cannot be denied. The physical impressions passing into the disen-

gaged eye do not reach the mass of cortical neurons upon whose activity for the time being the special state of consciousness depends." In like manner, the hysteric amblyopic is psychically blind and yet physically sees. The visual center, for the time being, represents an area in which neuron activity is lessened, but which, by some impulse, may be awakened and the fact that the power of visual perception exists be demonstrated.

Dr. de Schweinitz further called attention to the fact that these visual phenomena must sometimes be regarded neither as hysterical nor as simulated affections, but that they really represented symptoms that are prodromal of some organic disease.

DR. EDWARD JACKSON referred, in connection with the class of cases that Dr. Harlan has thought might be distinguished from malingers and particularly the case of the man who seemed to be ready to have his eye taken out, to the case, reported by Prince of Boston, of a man who had been twice examined and rejected as an applicant for a position on the

police force, on account of his imperfect vision, and whose vision was only imperfect when he covered one eye, who could see perfectly when allowed to look with both eyes.

Cases of this kind should be very carefully observed; and they may be of great value in throwing light upon the pathology of hysteria.

With reference to symptoms of hysteria being possibly the early symptoms of organic disease, it has seemed to Dr. Jackson that the condition in these cases is truly one of hysteria. These cases, in so far as the hysterical symptoms are concerned, are as truly hysterical in their nature as any cases of hysteria that one encounters; but the hysteria, instead of being caused by some mental or physical shock, or the dwelling on some possible or fancied defect for a time, has been caused by the organic disease present. The ophthalmoscope sometimes has to make the diagnosis between brain-tumor and hysteria, because the other symptoms being precisely alike, the ophthalmoscope, showing optic neuritis, alone will indicate the organic disease.

## IS THERE A DAILY RHYTHM IN EPILEPSY?

A. FERREE WITMER, M.D.

[Read April 14, 1897.]

This paper is a preliminary report from the Pennsylvania Epileptic Hospital and Colony Farm, where the observations were made.

During a period of three months from January 1st, the convulsions occurring in twenty patients were noted, and exact time-records made for comparative study. Twelve of these patients were females, and eight males. Their ages varied from eight to fifty-three years.

Following the etiologic classification<sup>1</sup> of epilepsy as adopted by the Craig Colony, of New York, we find in our tables three cases of genito-neuropathic origin; two following infantile cerebral palsy (post-paralytic epilepsy), one of imbecilic type, and one acquired by vicious habits. There was no case of hystero-epilepsy; none due to trauma or to senile changes, and none inherited. There were, however, twelve

cases in which the convulsive outbreaks began at periods varying from the ninth to the twenty-fourth year. These cases, after a careful examination for possible etiologic factors, particularly that of early cerebral or spinal hemorrhage,<sup>2</sup> we have called adolescent epilepsy. While brain-growth is practically complete at the close of the fifteenth year, yet as Venn<sup>3</sup> found that the heads of the Cambridge students increased in length, breadth and depth throughout the collegiate course, it is probable that the disturbances incident to growth may be felt longer than is commonly supposed.

A time-interval of not less than fifteen minutes was permitted to intervene before recording the second of two seizures. This was done to avoid as far as possible the condition of status.

The number of convulsions tabulated is:

over twelve hundred. Consciousness was lost in each.

Bannister<sup>4</sup> has recently contended that consciousness may be preserved during the seizure. It seems, probable, however, that a careful analysis of such cases would reveal some disturbance of the conscious state. Wundt<sup>5</sup> defines consciousness as the interconnection of psychic compounds, and further reminds us that every psychic compound requires the co-operation of numerous elements and many cortical

investigator stimulated by electricity the nerves leading to the spinal ganglion-cells of a cat, and at the end of one hour's time found that the nuclei of the stimulated cells had shrunk twenty-two per cent. After a period of sufficient rest, which would vary in amount with the age of the animal, the nuclei regained their normal size.

Lombard<sup>8</sup> ascertained by experiment that the energy in the muscles, and consequently also in the central cells, under-

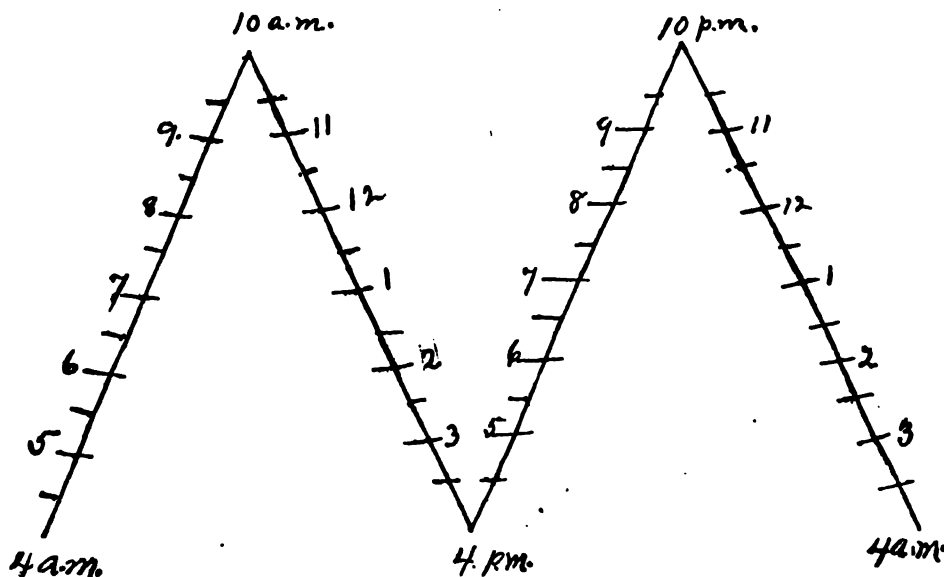


FIG. 1.

Physiologic Rhythm of the Nervous System. (The figures represent the hours.)

regions. A disturbance of one of these cortical regions, such, for instance, as the arm-area, is sufficient to break the complex of inter-connection.

It is well known that the nervous system is subject to daily variation. This rhythm is the outcome of a great biologic law, by which all sensitive vital substances are forced to alternate between rest and activity. In the nervous system, however, where this sensibility of the organism finds its most intense expression, the alternation of activity and recuperation is most marked.<sup>6</sup>

Fresh proofs of this are afforded by the now classic experiments of Hodge.<sup>7</sup> This

goes rhythmic variation in the course of each twenty-four hours. The result of these experiments I have attempted to show in the accompanying diagram modified from Lombard (Fig. 1). In the left-hand lower corner the marking 4 A.M. represents the time of least intensity of the nervous system in the morning hours. From this time there is a gradual rise in intensity until the maximum is reached at 10 A.M. From then on there is a corresponding decline until 4 P.M., when the point of minimum intensity is reached in the early evening hours. This in turn is followed by a gradual rise to 10 P.M., and this again by a slow fall to 4 A.M., and so

on. Frequent illustrations of these rhythmic states are afforded by bicyclists making a tour, who state that at eleven in the morning they would be riding swiftly with little effort; at about three in the afternoon they would begin to feel much fatigued; while at six or seven in the evening their strength would seem to return like a tidal wave.<sup>9</sup>

The second chart shows the time-scale as in the preceding chart, with the addition of the total number of convulsive attacks for that time marked. (Fig. 2.)

one-twenty-seventh of the entire number being noted at this time. The least number, fourteen—one-eighteenth of the total—is recorded at 7 P.M.

This record is fairly in accord with the theory of a dynamic expression of an inhibitory insufficiency in these states, as advocated by Langdon.<sup>10</sup>

Richardson<sup>11</sup> has recently reminded us that the most dangerous hours of the twenty-four to the melancholic are the latter hours of the night. Depression is then greatest, and the power of resistance

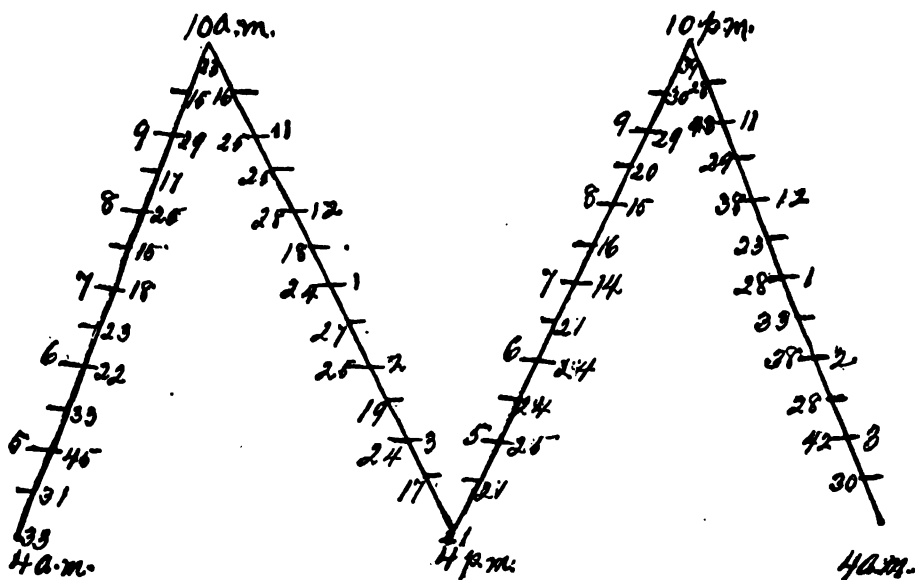


FIG. 2.

The lower figures represent convulsive seizures; the upper ones the hours.

In every case in which epileptic outbreaks occurred between the half-hours, credit was given to the half-hour the nearer in time. For instance 12.12 is recorded as 12; 12.17 as 12.30, etc. When the convulsions occurred at the quarter-hour, the number of convulsions for that time was equally divided between the hour and the half; thus ten convulsions at 12.15 are recorded as five at 12 and five at half after.

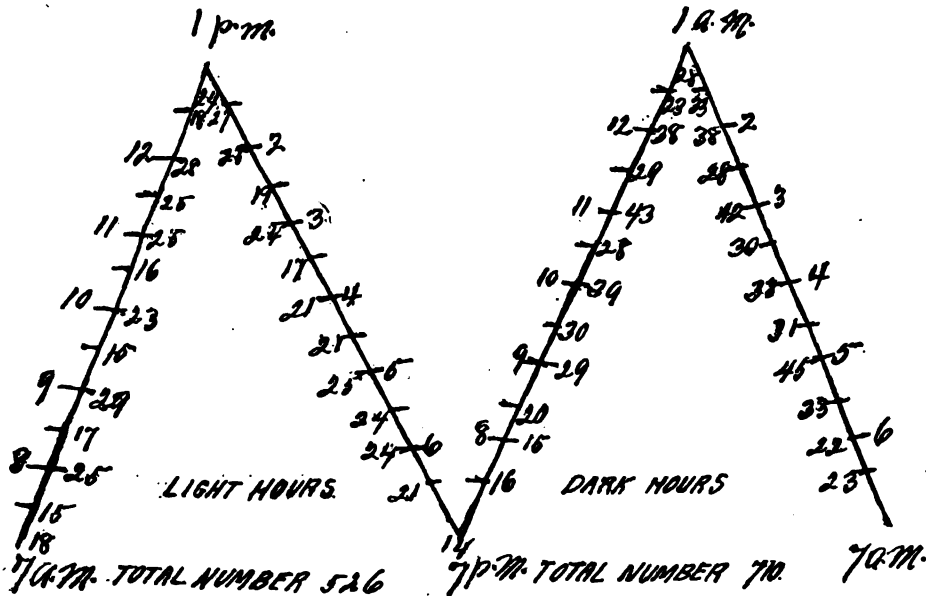
Glancing over the chart, it will be noticed that the greatest number of attacks occurred at 5 A.M.—forty-five, or

to the suicidal impulse is least effective. This fact is of interest here, as we find that of the total of over twelve hundred seizures, seven hundred, or about sixty per cent. occurred during the dark hours, and this although but one of the patients had nocturnal epilepsy.

This proportion is shown in the third chart, in which the light hours, with the number of convulsions occurring at the different periods of time, are indicated in the left hand scale, while the corresponding dark hours are shown to the right of the figure.

The number of convulsive seizures that we have tabulated is doubtless too few to afford a basis for positive statements, yet

the results obtained are strongly suggestive of an origin of the epileptic outbreak as advanced by Dercum.<sup>12</sup>



but speaking of the outlines of treatment as planned at the Epileptic Hospital, he related that the best results have thus far been obtained from the use of glycerin given in two-dram doses three times a day, after each meal. One formula consists of fifteen grains of bromid, water q. s., with sufficient glycerin to make a

dram. This has not been found as useful, however, as the total omission of the bromid and the substitution of the glycerin. This treatment has been in use for about three months, and the cases of status in particular are helped with regard to both the violence and the frequency of the seizures.

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## REPORT OF A CASE OF LACERATION THROUGH THE SPHINCTER ANI, WITH REMARKS ON SUITS FOR MALPRACTICE.

MORDECAI PRICE, M.D.

[Read April 14. 1897.]

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The accident of the burn in the case about to be reported presents some of those medico-legal phases in which, as general practitioners or surgeons, we are all interested. Reasoning from common-sense principles, that common sense upon which it is claimed all law is based, as medical men we are only responsible for those accidents preventable by reasonable or ordinary skill, care and diligence. We are certainly, by no principle of common justice, legally responsible, either criminally or civilly, for those accidents over which we have no control, or those the sequence of troubles, constitutional it may be, independent of those we surgically or medically correct or attempt to correct. Every self-respecting, conscientious physician expects to be held responsible for his results when they come within the limits of his control. This fact in itself puts him upon his best conduct, prompts the use of the best at the command of science, skill and the lessons of experience. The motives prompting these prosecutions, all the attendant incidents, have been and are more now than ever before, very closely analyzed by courts and juries, the animus, the mercenary motives at the bottom of them are judicially considered. It is very rare, indeed, that a physician, reputable with the members of his profession and in

the community, is guilty in any case of wilful maltreatment. He knows that such guilt, apart from criminal or civil liability, would close the doors of every honorable professional man against him, and close to him all avenues of legitimate and honorable practice. If fear of the law constituted no element of restraint in the matter, self-respect and self-interest would.

From the fact of the keen scrutiny of judges and juries into these cases not one in ten of the prosecutions for malpractice against regular and reputable physicians succeed. Yet there seems to be no avenue of escape from these vexatious, annoying, malignant and mercenary suits.

The suit instituted in the case of which I shall speak was evidently not thought of until after a bill for professional services had been rendered and payment demanded. The patient from the date of leaving the hospital seemed perfectly satisfied with what had been done for her, at no time complaining with any special reference to the accident or to her general treatment. I would here suggest as the best possible safeguard against these suits that the surgeon receive his fee at the time of rendering his services. I have tried this rule and find it to work admirably. Having paid for services seems to have a very soothing effect upon the patient, whose

general rest seems thus to be improved and who carries around with her less temptations for the lawyers.

The trouble growing out of the burn in the case about to be reported resulted from several causes, presenting unique phases from a medico-legal standpoint. The woman had been in a helpless condition for twenty-eight years from loss of control of the bowel, and in broken-down health from confinement in the house owing to this cause. Her troubles were further aggravated by varicose ulceration and congestion of the limb, having had a number of open sores which it was very difficult to heal. The operation was a long one, and the surgical work was tedious. There were really two procedures: one for the removal of an epithelioma at the mouth of the bladder, and the control of the ensuing hemorrhage required considerable time. The closure of the tear in the sphincter required twenty-three stitches. The two procedures occupied more than an hour for their completion, so that the anesthesia was a long one. The patient was severely shocked when placed in bed. Her age, about sixty years, was also a factor to be considered. Hot applications protected by flannel at such a temperature as could be borne with comfort by the cheek of the nurse were made. Notwithstanding all precautions the patient was blistered on the inner side of the foot, and the burn was some three months in healing. Some one has recently written an article calling attention to the fact that a patient reacting from ether-anesthesia will suffer a burn or a blister from a much lower temperature than one who has not taken an anesthetic. I am not able to confirm this statement from my own experience, but I am constrained to believe that it is correct.

The second of my experiences was a suit by a man who had been suffering from influenza and who was unquestionably insane. To care for him I demanded that the family employ a competent nurse or have him placed in a hospital to prevent his doing harm to himself, his family or his neighbors. They demanded a consultation, and Dr. F. X. Dercum saw the

patient on the night of the same day I had informed the family of his condition. I was unable to meet the doctor, but he wrote me immediately, saying that if I did not have the patient removed at once he might kill somebody. I had given him a prescription for seven and one-half grains of chloral and an equal quantity of potassium bromid in a teaspoonful of sirup of red orange. In this suit for malpractice, the family fixed their claim for damages at five thousand dollars. This case remained on the docket for three years. It could not be forced to trial, and was at last dismissed, the plaintiff paying all costs and my bill in full for personal services, with interest from the date of its rendering.

The damage to the physician in these cases is not in a moral and professional way. In that direction rarely are they to any extent damaging; but they vex, take his time, the time to which his patients are entitled, break in on his business and necessitate the expenditure of some money in the preparation of his defence. These facts are well known to the class of patients who bring these suits and the class of lawyers who encourage them. The lawyer takes them on contingent fee—"Nothing if I can get nothing out of the doctor, and if I get anything about all I do get." He anticipates the terror of the doctor at being sued and that he will pay liberally to escape being taken into court. Every case compromised encourages such annoying and time-wasting legislation and is an injustice to the profession. Such a case should under no circumstances be compromised—not a penny for tribute, but all we have for self-defence.

*Complete Laceration of the Perineum.*—Dr. Hinkle asked me to see Mrs. Y. with him in consultation on October 1, 1894, with a view to an operation for the removal of a bleeding growth at the mouth of the urethra. It was as large as a hulled walnut, and gave her great pain and annoyance, with a constant discharge of blood and pus. This condition had been produced by the constant use of bandages and cloths applied to the parts to prevent the intestinal discharges from soiling her

clothing while sitting or walking. Examination disclosed the fact that the perineum had been torn through into the bowel for a distance of two inches. This occurred some thirty years before, when she was delivered of her only child. The growth presented all the appearance of malignancy, and to remove it and leave the cause would have been to insure its return. The woman was told that to prevent its return there would have to be an effort made to close the rent in the bowel so as to protect the mouth of the bladder. Dr. Thos. S. K. Morton had previously closed a vesico-vaginal fistula.

Up to this time the patient had refused any other operative interference, and would not now have consented had it not been for the condition of the growth. She stated that if both operations could be done at the same time, she would consent, as she was unwilling to take the ether twice. I agreed to take her into the hospital, and on December 10, 1894, she entered and was prepared for the operation, which was done two days later.

The patient was a large woman, and the parts were greatly swollen and irritated by the discharges from both the bowel and the malignant growth at the mouth of the bladder. The changes in the parts made the operation a difficult one. The tumor had to be removed first and then closure effected of the septum that separated the vagina from the bowel. This was done by cutting away all thickened mucous membrane over the parts that were united before the accident at child-birth, then closing from one inch above the top of the rent in the vagina and bowel, and continuing the stitches down to the outlet of the bowel, and finally exposing the ends of the sphincter muscle and re-uniting them after thirty years' separation and non-use. The closure required the use of twenty-three stitches. From non-use and atrophy of the muscle the mucous membrane protruded over the sphincter for about one inch and a half. To insure union this prolapsed portion should have

been removed, but to do so would have been to prolong the operation to a dangerous degree, in the greatly debilitated patient and one already greatly shocked from the ether and amount of work done. It is to be remembered that the woman had been a confirmed invalid during the entire period from the birth of her child to the time of the operation. When I first examined her, she told me that she could not go out without the liability of discharges from the bowel soiling her clothing before she would get off her front steps.

The operation was a greater success than we could reasonably have expected in a patient in such poor condition for so many years, and with the added complication of prolapse of the bowel. At the time she left the hospital she had a small fistulous opening near the bowel, from the giving way of one of the stitches. Her nervous system was so broken down that it was with the greatest difficulty that I could get her to let me remove the stitches and then only one or two at a time. She would shake the bed from fear even before anything was done.

After the operation, when the patient was placed in bed, she was greatly shocked. Warm blankets and hot bottles were applied, as in all other cases of danger from shock. From one of the bottles she received a blister on the right foot, under and a little to the front of the joint. This burn was so slight, that had the patient been in good condition, it would have healed in a very few days, but she had been suffering for years with varicose veins of both legs, with ulceration at times, that would not heal until the patient's condition was improved by treatment.

After the patient returned home I examined her, at the request of Dr. Hinkle, as he thought the malignant growth threatened to return. I found the fistula almost closed and leaking but little, and the sore foot healing nicely. The latter was completely well on March 1, 1895, as the patient informed Dr. Hinkle at that time. The fistula closed before the burn healed.



## DISCUSSION.

DR. JOHN C. DA COSTA asked, if all cases of ectopic gestation are tubal, how it would be possible to explain a case that fell into his hands a few years ago. He operated upon a woman for ectopic pregnancy, and immediately, at the end of the fimbriated extremity of the tube, found a large clotted mass, in the middle of which the fetus was situated. The tube of that side was removed and examined very carefully, but no rupture was found at any part from the uterus to the fimbriated extremity.

DR. JOSEPH PRICE said that operations for the relief of sphincter tears and growths about the urethra expose the physician to the risk of a prosecution. Operations for sphincter tears or recto-vaginal fistulas are not, as a rule, real successes. In the older cases it is common, indeed, for the operator to miss the sphincter entirely. The little half-moon sphincter is not recognized from the deep dimples on right and left. In the soft parts, if the labia are closed, these surfaces may be brought together with the retracted ends of the sphincter muscle at the lower level, and the union here of soft structures is always successful, and with that one may have a fistula above, if the tear in the septum is a deep one, clear up to the cervix. It is just in cases of this kind that the physician is exposed to prosecution, particularly if he fails to get his money at the time of operation. Suits are rarely thought of if operations are paid for primarily, and that, again, is an element in morality. If the fee is paid the day the patient is operated on, the mortality will be reduced to one per cent. Patients always do best if an operation is paid for.

Ectopic pregnancy always opens up an interesting discussion. The work commenced in Philadelphia, and it was John Perry that contributed the most valuable and, at once, most scholarly book ever written on this subject. In short, every author since has followed Perry. While the Scotch and English try to claim for John Bell the original suggestion that abdominal surgery should be done successfully, and that it was the counsel of Bell to do ovariectomy that stimulated McDowell, this is not so. McDowell had a fellow-statesman in William Baynum, whose two successful operations, premeditated, deliberate abdominal sections, done in 1790 and 1799, or nine or ten years antedating McDowell in his oophorectomy, had thrice more

influence than the simple suggestion of John Bell, and no one will think for a moment that McDowell was ignorant that William Baynum had done these two successful operations.

It was John Light Atlee who did the first operation for tubal and ovarian disease in 1843, at Lancaster, Penna., the one specimen weighing fourteen ounces, the other sixteen ounces. The operation was a pelvic one, if tubal and ovarian, and there again the operation belongs to America, and not to Tait or to Hegar or Battey. More than a century ago in New Orleans extirpation of the uterus was successfully performed a number of times.

Dr. Price's experience has been peculiarly fortunate in ectopic pregnancy. He has never seen anything but tubal pregnancy. He considered the case of Dr. Da Costa one of pavilion pregnancy. That is common enough. Of the cases recorded as pelvic hematoceles, and usually alluded to as classic hematoceles, Dr. Price knows nothing, excepting those due to the thrust of a darning-needle. Only recently he had observed a horrible hematocele from the thrusting of a big skewer through the bladder into the rectum. The big wire pin was removed, with a big calculus surrounding it.

DR. M. PRICE, in speaking of peculiar cases of extra-uterine pregnancy, referred to a case that went to term, both mother and child still living. The fetus lay against the diaphragm, enclosed only in its amniotic sac, containing clear, pure amniotic fluid. Only a small portion of the placenta was attached to the left tube, the uterus being almost entirely free. Dr. Price believed it to be possible for the placenta to be entirely detached from the tube, having seen a number of cases in which the placenta was so completely adherent to something foreign to the uterus and its surroundings that he knew of no reason why some accident should not detach it entirely. He referred further to a peculiar case of his brother's, of which it would have been utterly impossible to say that it was not an ovarian pregnancy. Ovarian stroma could be seen on part of the tumor, the ovary having been dragged and stretched out over the whole tumor. There was, however, ample evidence and proof that the fetus had originally come from the tube, and that the ovary was only incidentally connected with the pregnancy.

## SOME OF THE COMMON CAUSES OF MORTALITY IN ABDOMINAL SURGERY.

JOSEPH PRICE, M.D.

[Read April 14, 1897.]

To reason concerning mortality in surgical work is to consider finally its entire field and treatments. It is mortality that we combat. To speak of mortality in relation with surgical achievement is to relate the entire advantage of surgery. Such a discussion would be impossible. We may discuss the expediency in restricted lines profitably, but an infinite labor would be involved in accurately determining a conclusion from the surgery of to-day. It lies within our power to generalize, however, upon this subject, and to infer from the many presentations of worthy co-workers, together with our own personal experience, certain forceful evidences of judicious direction in operations.

Foremost among the attributes of success I place operative skill, that is, a wise, serious, clever artisan; a good workman; a confident operator, sure and rapid; a man abundantly capable for every emergency, with a constant reserve of power and resource to meet any contingency. This simply means a painstaking scholar, whose close attention and perseverance have developed a power of performance. A professional aspirant of any stamp aims at a perfecting of his parts to his peculiar work. A runner works for every respiration during strong physical exertion. His organs must adapt themselves to his new purpose. The peculiar adaptations for which the surgeon must develop are difficult of definition. For one thing, his touch-sense must have a certainty and a delicacy, supported by an accuracy of muscular control, that would do credit to a first violinist. His intelligence and fair knowledge of his art are presupposed. While speaking of the surgeon himself I would mention one other strong element in his success, that is nerve-force or vigor, which is undoubtedly essential to the successful management of an operation. He must be in a condition for a feat, must be clear, self-possessed,

undisturbed by considerations foreign to his subject's immediate advantage and welfare. So very numerous and varied in form are the accidents that require the highest and most experienced surgical skill, and not a few accidents that add to our mortality, are associated with, or are direct incidents of, the surgery itself; that it is of first importance that the surgeon's ability, his fertility of resource, should be the greatest of possible attainment. To the surgeon there is a fitness in Napoleon's illustration of his own resources in emergency: "There is nothing in war, which I cannot do by my own hands. If there is nobody to make gunpowder, I can manufacture it. The gun-carriages I know how to construct. If it is necessary to make cannons at the forge, I can make them. The details of working them in battle, if it is necessary to teach, I shall teach them. In administration, it is I alone who have arranged the finances." There is something sublime in this courage, this sense of fertility of resource, this egotism, if you please. Something of it in our surgery would diminish our mortality. Timidity disturbs and unseats judgment.

Surgical courage is something other or more than temperamental. It is educated; it is a self-confidence, coming of that mastery which apprenticeship gives. It inspires and directs the doing of that which timidity shuns, appreciating possibilities, and dares when situations are desperate. The statistics of the mortality due to shirking of responsibility, to cowardice, will never be given; nor will those of ignorant, over-weening, ill-founded confidence and rashness. Voltaire said: "One of the chief misfortunes of honest people is that they are cowardly." For the medical profession there is no *discouragement* in this statement.

The greater our successes, the more dis-

satisfied we become with our failures; the more we feel and know that many of them should not occur, and the more disposed we are to inquire into their causes. Many credit failures to the use of a particular method, rather than to the unskilful use of the method, and they change to something to them new, with little, if any, better result; generally with an increase in their mortality.

The extent to which various causes influence mortality is impossible of determination, as we have no reliable statistical data upon which to found an opinion. All that we can venture are mere deductions of individual experience. No stronger duty presses upon us than that of search for the causes of our failures. Errors of diagnosis are a fruitful source of mischievous results. Beginning with mistake, all following is mistake or accident. Diagnosis in abdominal disorders is not always easy, as these are concealed troubles, and it is not always easy to get from the patient a full, clear and definite history. Not least among the surgeon's early difficulties is the tendency to concealment. It seems natural for people to shrink from disclosing their lives, even to the physician. This appears to imply a certain unworthiness in even having an ailment, much the more to give intimation of its suspected origin. One is almost inclined at times to consider Hawthorne's fancies as to the relations of moral health and physical conditions entirely truthful. The tendency of all fault is to see darkness, and people seem everlastingly occupied in screening themselves from the eyes of their fellows.

We have no resource here but unflinching science. We must be able to decide without much dependence upon the patient's story. There are, of course, exceptions, cases in which the subject is entirely frank and helpful. Many of the diseases with which we have to deal, and find the most difficult to combat, have a beastly genesis, and much is concealed from very shame.

As physicians and surgeons we know the origin of many of the gynecologic troubles for which we operate; the complications and sequelæ are always of

serious concern. Unfortunately, many of the patients fill the sacred office of wife and mother. In all, and to all, we are enjoined to a sacred silence. These diseases in operative cases increase mortality to an extent not indicated by death-certificates. The death-certificate makes no note, perpetuates no record of that which the law, in its questionable charity, passes as unindictable crime.

Outside of hospitals, general and private, the practitioner encounters unfavorable conditions, those affecting his mortality, which he cannot control, however zealous and enlightened may be his endeavors. He finds in homes and their environment miserable hygienic conditions, and that which not infrequently goes along with such conditions and which our science and art are powerless to correct, depraved social life.

The morale of the patient has always much to do with the successful termination in all cases of surgical interference. It is very essential that the patient should be bright, cheerful and hopeful. The patient's trouble should always be presented to her with great frankness and tact, in the simplest and most intelligible forms of expression. There should be no deception, no use of words exciting unnecessary alarm. There are certain offensive expressions that exercise a very vicious influence over the patient, such as: "You have a tumor; it will have to be cut out," "You will have to be opened," "Madam, you will have to go under the knife." Inspiring and sustaining a healthy and hopeful morale is a duty with both nurse and surgeon.

So-called shock is, in a majority of cases, the result of or is caused by hemorrhage. Fatal shock may be caused by the enucleation of a densely adherent tumor over the large ganglions of the sympathetic nervous system. The tendency to this can be noticed in a more or less marked degree while the operation is in progress by failure of pulse, sighing, irregular respirations and the appearance of the patient, which is that of impending death. There is no question but that many of the cases put back to bed after

operation in a moderately good condition gradually sink and die in from twelve to sixteen hours from hemorrhage, and not from so-called surgical shock. Shock is less frequent than formerly. It is avoided through our less barbarous methods of treatment. When it occurs, it is largely due to prolonged operations, prolonged anesthesia, the violence of operations about vital parts, excessive use of ligatures and sutures. Occasionally we read reports of cases requiring forty or fifty ligatures to control hemorrhage. The same operation in the hands of some other operator would probably have required but one. The anesthesia and the operation are prolonged in the application of ligatures. Excessively hard tying causes great pain and adds to the shock. A hot irrigation-toilet, when filth and debris exist, speedily cleanses and favors reaction. The hot water is taken into and stimulates the circulation. Rapid operation is an important factor. Tolerant as may be the peritoneum, there is a limit to the impunity with which it may be exposed without risk. Chill adds to shock, and an unclean atmosphere to danger of infection and septic peritonitis.

The chances of infection and hernia are less with a small incision. The length of the incision must be regulated by the size and the character of the growth. In cases of the removal of hard irreducible growths the incisions are necessarily large. Our mortality is increased by not taking into consideration other organs than the diseased one, or the special trouble for which we operate. There may be diseased lungs, heart or kidneys, the history of some inherited trouble, and other important considerations. It is needless to name those cases in which the risk is greatest, the mortality high. One of a group calls attention to facts associated with others. We know that puerperal suppurative peritonitis commonly results fatally, especially if more is attempted than irrigation and drainage. Extirpation of the so-called septic uterus is uniformly fatal.

Curettage practised after abortions and fancied abortions is commonly followed by violent septic peritonitis. Section, irrigation and drainage will save life under

these circumstances. General tuberculous peritonitis results in death unless surgically treated. Section, with the freeing of all adhesions and drainage or no drainage, results in the majority of cases in cure. Now, as always, I place special stress on irrigation and drainage, and urge the utmost refinement of every detail of the surgery. The most *unsurgical of all practices* is that of "reliance upon the ability of the peritoneum and general system to eliminate infectious matter," without the aid of drainage.

Such teaching is positively bad, whether carried on in our schools, private clinics or from the chairs of our medical societies.

To patient, physician and surgeon the nurse's office is one of pre-eminent importance. The practitioner, general surgeon and those following special lines of surgery have learned from many disappointments and painful experiences the extent to which ignorant, careless and inexperienced nursing has contributed to their mortality. The matter is one of equal interest to physician and surgeon. Societies, scientific and philanthropic, have greatly improved the personnel and education of our nurses. There is much yet needed to elevate the standard of nursing to what it should be. Too many attempt the office with little elementary education, some without the least pretence to a common-school education. There is needed culture combined with natural intelligence and aptitude. Nurses are sometimes socially uncongenial, unfortunately possessing those peculiarities of disposition that render them positively offensive to patients.

Nurses should be impressed with the responsibility and dangers incident to their work, that theirs is the care of a life, in maternity cases of two lives, and that everything associated with the welfare of their patients should be studied with an intelligent interest. They must have a general inclination to forbearance and everlasting patience, must be wise and, before all, cheerful. The doubt and fear that undoubtedly find place in the patient's mind prior to the operation should find no confirmation in the manner of the attendant. The circumstance is no matter of gaiety, yet

there must be suggested to the patient a confidence and support in the persons of the physician and nurse.

The progress of disease cannot but develop distress, mental and physical, in the surmounting of which lie the art and the utility of the nurse. This art is not all a gift. So much strangeness and uncertainty surround life that the smallest bodily ills receive the most serious attention and become often great afflictions through exaggerated thought. This state the nurse can aggravate through unguarded speech or conduct. It is her duty to have a solicitude independent of affection and ties of kinship. Our subjects are usually depressed in spirit by reason of their malady and the constant consideration of their condition; and large and difficult is the office of the nurse in removing this depression.

Order and taste in the apartments, the pleasant appearance of the nurse and her evenness of temper are of course well-understood elements in the sufferer's welfare. But beyond all this there must be a considerateness of speech on the attendant's part that shall serve without fail to divert attention from the ailment. Conversation should be limited and the nurse's words carefully judged and modified for the character of her subject and growth of confidence. They should always be words of encouragement and hopeful stimulus. There should be little or no talk about disease or operations.

The idiosyncrasies, the eccentricities of the patient should be noted, the peculiar habits and the trend of thought studied and directed in healthy and hopeful channels. That the nurse should in morals be without even the suspicion of blemish, in speech, in entire person, clean, cannot be questioned. There is nothing so subtle in its infective, septic influence as moral filth, whether in physician or nurse.

The nurse must be thoroughly trained, and must have much of a surgeon's courage to deal with grave conditions without feeling or manifesting alarm. Repeatedly I have heard physicians say after witnessing an operation: "Doctor, there is little chance for that woman," while the exper-

iented attending nurse made no sign of any other confidence than that of a successful result. She should do everything cleanly, quickly, deftly and not wear the patient out by her sleepy, slow, clumsy motions.

Nursing must be something more and better than merely mechanical; it must have brains, educated hands, the quick intelligence and spirit to appreciate and respond quickly, quietly and intelligently to all the wants and necessities of the patient. The ranks of our nurses have been too largely recruited from that class who on retiring to bed throw their clothes on the floor and kick them under the bed.

There is no means of determining the percentage of mortality caused by dirt, uncleanness, dirt somewhere about the person, the hands, the fingers, the clothes, instruments, the fine English cut or patriarchal beards of the operators, about the room and its appointments, the bed, and its clothing. Antisepsis cannot correct the mischief; it in itself is not always harmless.

Too much has already been said in favor of the doctrine of antisepsis, and too little in urging the practice of asepsis. The surgeon who has reduced and kept his mortality low must acknowledge his debt to scrupulous care as to aseptic conditions. These are obtainable conditions. We repeatedly have coming into our hands cases in which the chances for and against recovery are very evenly balanced, and but little dirt or that with septic taint will turn the balance against us. In abdominal operations the surgeon should commence clean, wash out clean, and drain. The drainage-tube will keep the general cavity of the peritoneum free from all septic and abnormal contents, and decomposing ooze. We know that for those extraneous conditions producing septic infection, the surgeon and the nurse are largely responsible. We further know, when septic infection is carried into the peritoneal cavity or arises from some internal cause, that unless it is promptly and thoroughly dealt with, the patient dies. We know that patients die when we depart from certain well-settled rules.

## DISCUSSION.

Dr. A. FERREE WITMER pointed out that the irritation that may result from an operation upon a large mass of sensitive nerve-trunks is to be considered among the causes that may induce shock. He referred to the case of a woman about to be operated upon for uterine tumor, who, though she had been in a debilitated state for some time, was apparently in good condition at the time. She was taking the ether well, and respiration and pulse were good, yet no sooner was the knife placed upon the skin—not even the first layer of muscle being cut through, than she gave a gasp and died. Cases like this do not occur frequently, but they do sometimes occur, and death might, perhaps, be explained by shock of reflex origin.

Dr. JOHN C. DA COSTA expressed satisfaction that Dr. Price advocated so strongly the necessity of perfect cleanliness in operative surgery; that asepsis is really superior to antiseptics. In some cases bad results follow the use of antiseptics. Some ten or twelve years ago, when Dr. Price asked his views as to the conduct of a celiotomy, Dr. Da Costa said: A clean room, a clean doctor, clean assistants, a clean patient, and plenty of clean water, and the favorable results have been due to that rather than to antiseptics.

Dr. Da Costa concurred, also, in the necessity for an able, competent nurse, and nowhere more than in a celiotomy. Too many women adopt nursing either as a makeshift or to improve their revenue, without necessary qualifications. Dr. Da Costa was unable to agree as to the necessity of drainage. While Dr. Price had had wonderful results with drainage, others get very good results without it. With a clean operation and a clean abdomen, Dr. Da Costa favors closure of the wound. It is a question whether sometimes free drainage does not give rise to post-operative troubles.

Dr. M. PRICE did not think that in the case cited by Dr. Witmer death could be attributed to irritation of any particular nerve-supply; it was his impression that there was some cause for death outside of the surgical operation entirely. He has seen two deaths from chloroform in the hands of most careful men, occurring in perfectly healthy, vigorous women, who died before the application of the knife at all.

Dr. Price expressed astonishment at the number of cases operated on in this country, by competent and incompetent men, and the infrequency of death on the table. Many of the patients are at the point of death at the time of operation, and it would be only a question of a few hours that death would result without it. In a case of strangulated hernia that Dr. Price attempted to relieve, at the urgent request of the family, the patient died on the table, the only case in his experience in which this event occurred.

A reference to the Reports of the Johns Hop-

kins Hospital will show, for instance, that the acute cases of extra-uterine pregnancy operated on from March, 1890, to February, 1892, were all treated without drainage, save one. Scrutiny of the temperature-chart and of the pulse-record will create surprise that six out of the seven survived. It is a common experience with Dr. Price to see a case of surgery with someone who has attempted to cure the patient with an abdominal operation without drainage. Many of the cases get well, but others, and a much larger percentage than there ought to be, die. A drainage-tube has never given Dr. Price a second of uneasiness, as he feels that he has within his grasp the means of preventing many of the accidents and dangers that otherwise the patient might suffer from. If taken care of as it should be—and it should be taken care of by a person trained especially in the work, especially to keep the tube clean, to keep herself clean, to keep the articles that she uses for drainage clean, to keep the patient clean—Dr. Price believes that the abdomen could be closed over it, and it could stay there indefinitely, for now the tube should be placed properly, as it has a specific purpose. If jammed down in the pelvis, or on top of a fold of bowel or knuckle of intestine, and thus left to do its work (and it may be at the highest point in the pelvis instead of the lowest), it will fail in its purpose; but if placed in the lowest part of the peritoneal cavity, where the drainage will necessarily drift to it, it cannot do other than good. Looking over the work of others who use no drainage, Dr. Price felt confident that drainage would have been of service in many cases; and the saving of even only one or two per cent. is an end to be secured; but it must be repeated, the drainage must be done properly, and be carefully and intelligently looked after.

Dr. HENRY BEATES said that the matter of drainage has been spoken of rather indefinitely. He has seen the drainage-tube so used that it produced much mischief, and he asked for details concerning the proper management of the tube. In the experience of Dr. Beates the tube is not properly used by many of those who *think* they use it as it should be. The substance that is employed in the tube to act as a capillary drain, as well as the method instituted, is often to be very severely criticised.

Dr. JOHN C. DA COSTA said that a recent number of the *American Journal of Obstetrics* contains a chart showing the results of 1700 abdominal operations in the Johns Hopkins Hospital, among which the mortality increased directly in proportion to the amount of drainage.

Dr. JOSEPH PRICE said that about 20 per cent. of the cases recorded in the Johns Hopkins Hospital report are ventro-fixations. The

statistics include further 37 pus-cases, with vaginal puncture and drainage. Of this last number one died and three or four returned for re-puncture and drainage a second and a third time. Dr. Price referred to a number of cases in which vaginal puncture was followed by unpleasant symptoms, requiring abdominal section. Of the Hopkins cases two or three required section, some other forms of relief, and two or three were never heard from. Of 11 cases of ectopic pregnancy, with vaginal puncture and drainage, one was lost, and another required abdominal section. The success of drainage will depend upon when, where and by whom the drainage-tube is placed, as well as the after-care. If a small glass tube be preferred it should be placed at the most dependent point, at the dirtiest place. It is a simple matter for any one to place a drainage-tube at the bottom of the pelvis. It is the after-care that is most important, and it is a great advantage to have a special nurse for the purpose. To clean the tube once a day is not drainage. Dr. Price details two nurses to look after a patient requiring drainage. One takes care of the patient, and the other of the drainage. The latter does nothing else, and is not even permitted to open the door. She keeps her hands in mid-air and scrubs them. She is not allowed to use a handkerchief, and no menstruating nurse is allowed to take care of drainage. The

second nurse devotes herself exclusively to the care of the drainage-tube, which she may clean every half-hour, sucking it out and making it dry, and hermetically sealing it if she wants. The tube may be kept covered by a bichlorid filter, or corrosive gauze or cotton. That tube is raised  $\frac{1}{4}$  inch the first night, and kept dry.

It is drainage that has given us the successes of the abdominal surgery of the present day, and it is ignorance of the refined care of drainage in the practice of all condemning it that is giving them the high mortality they have. It will be found that the man in this country who condemns drainage will ask if 15 per cent. is not a good mortality.

In the case alluded to by Dr. Witmer the abdomen was not opened. The patient had taken perhaps five whiffs of ether, gave one gasp and was dead. Surely the result was not attributable to the ether, and surgery had nothing to do with it. Death not rarely results because the operation has been too long deferred. There are conditions in which sepsis has advanced so far as to be incapable of arrest. This fact illustrates the importance of drainage. For instance, in septic peritonitis, puerperal or due to appendicitis, or due to typhoid fever, or due to perforating ulcer, to arrest sepsis is to save life. Ether is a stimulant, doing patients good, bringing up their pulse, and improving their respiration.

DR. JOSEPH PRICE exhibited a

**SMALL CYST OF THE LEFT SIDE, COMPLICATING CYSTIC DEGENERATION OF A FIBROID IN THE CROWN OF THE UTERUS.**

The growth had been noticed but a short time before. Suddenly it disappeared without pain, and the woman remained at rest for a while, without discomfort. Following the disappearance of the tumor two operations were performed for malignant disease of the breast. Several years later a tumor was noticed developing in the median line, bleeding irregularly and profusely, and a fibroid was recognized. As she was approaching the menopause, she was urged to leave it alone in the hope that it would atrophy. Subsequently the tumor grew rapidly, and interfered with locomotion, while the pressure-symptoms became quite marked.

On opening the abdomen there were found quite universal adhesions about the sigmoid, a tumor, and an old cyst, but the cyst was wide

open, with a hole in it large enough to receive a lemon. The old sac about its entire circumference made a perfect window. It was necessary to free the bowel for at least six inches from the tumor and the sigmoid and hug the bowel closely to do it, and stitch the peritoneal margin of the bowel for some six inches. In removing the uterus entire, it was also necessary to free the bladder from adhesions to the tumor in front.

Dr. Price referred to another case in which he found an old pus-sac of an ovarian abscess and a pus-tube on the left side, precisely the same seat of fixation in the left side of the bladder; with a history of leakage from the bladder. It was necessary to cut matter from the bladder as one would cut rot from an apple. These conditions are often disputed, but Dr. Price has seen them in sufficient number to feel that they actually exist. They represent a cystiform degeneration, though not the cystiform degeneration of fibroids that is commonly recognized. The specimen was full of cysts containing fluid of some character. Cystiform degeneration commonly belongs to the large fibroids.

# AN INQUIRY INTO THE CAUSE FOR THE LARGE MORTALITY RESULTING FROM SUPRAPUBIC CYSTOTOMY. REPORT OF SEVENTY CASES, WITH BUT ONE DEATH.

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[Read April 28, 1897.]

The large mortality shown to result from suprapubic cystotomy, from a careful study of the statistics collected from numerous writers, seems to be not only greatly in excess of what it should be, but quite inexplicable. It is to be regretted that the data relating to the subject are very meager, and that the statistics at the command of the profession pertain only to cases operated on for the relief of vesical calculus, or for hypertrophy of the prostate gland.

I have performed the operation seventy times, with but one death. The natural inference is therefore that among the reported cases the mortality is, to say the least, far greater than it should be.

Cabot, in *Morrow's System of Genito-Urinary Diseases*, submits statistics derived from 744 cases of suprapubic lithotomy, as follows:

Children under 14 years of age, 591 cases, 74 deaths, mortality .....	12.52%
Adults between 14 and 50 years of age, 100 cases, 12 deaths, mortality .....	12.00%
Old men, 83 cases, 17 deaths, mortality .....	33.07%

Garcin has collected 106 cases, of all ages, showing a death-rate of 24.4 per cent. Taffier reports 120 cases (ages not stated), with a death-rate of 27 per cent. Dulles, in 231 adults, gives a percentage of 32.4, whilst in 132 children there was a death-rate of 21 per cent.

Since his first statement Cabot has collected the details of 165 cases (ages not stated), in which there was a death-rate of 15.15 per cent. The most recent statistics, those of Cabot and Berling, show an exhibit of 84 deaths out of 637 operations, a mortality of 13.1 per cent.

The mortality from suprapubic prosta-

tectomy, in the first series of cases that have been tabulated, was 25 per cent. In the next reported series it was reduced to 18 per cent., and in the last group collected by Belfield it was 13 per cent.; and it is highly probable that, with the marked improvement in the technic of the operation, the more careful preparation of the patient and the greater attention to antisepsis, a much lower rate will be attained.

The clinical history of the fatal case in which I operated may be here briefly given:

The patient was a man, thirty years old, much reduced in health and strength, having been an invalid five years when brought under my care. His medical attendant had made a diagnosis of "chronic gonorrheal prostatitis and cystitis." The man stated that he had been in perfect health previous to five years before presenting himself, when he contracted gonorrhea, which, some months later, involved the posterior urethra and bladder. This was followed by inflammation of the left testicle. From this time he had suffered from a severe inflammation of the bladder, which did not yield to treatment. He urinated at intervals of half an hour during the day, and from four to five times during the night. He suffered great pain at the head of the penis towards the close of each effort at micturition, with a burning pain along the entire course of the urethra when urinating. Frequently there would be a sticky mucoid discharge, which would ooze from the meatus after defecation. Examination through the rectum showed the prostate gland to be enlarged and very sensitive, pressure inducing a desire to



urinate. The urethra was very sensitive; the prostatic portion of the canal was congested, inflamed and covered by a mucopurulent secretion. The capacity of the bladder was four ounces. On passing a staff a large calculus was discovered, occupying the base of the bladder, the mucous lining of which was markedly inflamed and thickened.

The urine contained albumin, and under the microscope were found epithelium, blood-cells and pus-corpuscles, together with crystals of oxalates and phosphates. The diagnosis was chronic prostatitis and cystitis, with a vesical calculus.

Two weeks were employed in getting the patient into the best possible condition to withstand an operation. He was prepared in the usual manner and the bladder was opened by a suprapubic incision. On passing the finger into the viscus, a large stone was found encysted at the base of the bladder, adherent to the walls of the organ. It was necessary to detach the stone from its environment by means of the Allis dry dissector. When freed it was found to be too large to be removed through the incision. A Forbes lithotrite was therefore inserted and the stone crushed, the fragments being removed without difficulty. The patient died on the third day from suppression of urine. The stone weighed two and a half ounces. Large encysted vesical calculi are very rare, and patients thus afflicted usually succumb to operation.

Of the seventy cases in which suprapubic cystotomy was performed, death occurred in one, *i. e.*, a mortality of 1.4 per cent. Among these there were twenty-two of stone in the bladder, making a mortality therefore of 5 per cent. for suprapubic lithotomy.

The youngest person upon whom the operation was performed was three and the eldest was seventy-five years of age.

So far as is known, of the 70 cases 49 are still living and may be thus classified:

Vesical calculus.....	20
Prostatectomy.....	4
Permanent drainage for malignant disease .....	2

Tuberculous disease of prostate and bladder .....	8
Retention of urine from hypertrophy of prostate.....	2
Permanent drainage for hypertrophy of prostate.....	7
Chronic cystitis.....	9
Retrograde catheterization.....	2
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As already stated, the patient who succumbed to the operation died from suppression of urine, three days after its performance. Had the operation been postponed, it is not probable that he would have lived many days. The other twenty cases lived for from three months to five years after the operation, dying respectively of old age, hopeless malignant disease, tuberculosis, uremia and abscess of the kidney.

The operation in cases of tuberculous and malignant disease was performed in order to drain the bladder, relieve pain, and prevent the necessity of frequent-recurring micturition, and in cases in which the employment of the catheter had become impossible. In every instance the immediate relief that followed justified the performance of the operation. The prostatic cases were all in old men; death in each case was incident to the years of the individual. Life was rendered more comfortable by reason of the operation.

The following is a table of diseases and conditions of the cases in which I have performed suprapubic cystotomy:

Stone in the bladder.....	22
Prostatectomy.....	8
Tumor of the bladder.....	1
Permanent drainage on account of malignant disease of the bladder and prostate.....	6
Permanent drainage on account of tuberculosis of the prostate and bladder.....	8
Retention of urine due to hypertrophy of the prostate.....	2
Permanent drainage and hypertrophy of prostate (Hunter McGuire's operation).....	10
Stone in the bladder, with prostatectomy.....	1
Drainage and chronic cystitis.....	11
Retrograde catheterization.....	2
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Why eminent surgeons in performing

suprapubic lithotomy should encounter such great mortality, I am unable to comprehend. After the bladder is fairly opened it ought not to add to the risk, or increase the danger of the operation, to gently introduce into the wound a pair of lithotrite forceps and extract a stone. Should the stone be too large to be removed through the incision in the bladder a Forbes lithotrite can be gently introduced through the wound, the stone seized and crushed, and the fragments removed by means of forceps. This maneuver I have practised without injurious results on several occasions.

The mortality of suprapubic prostatectomy ranges from thirteen to twenty-five per cent., being but slightly higher than that of the operation for lithotomy. This should not be, for it is obvious that the careful removal of the calculus after the operation should not complicate it in the slightest degree; whilst the excision of a portion of the prostate gland not only requires much longer time for the operation, but constitutes beside a very serious additional risk, often attended with copious hemorrhage. There is also danger of the development of sepsis, from the absorption of putrid matter with which the gaping wound at the base of the bladder is frequently bathed when cystitis is present as a complication. The same is true when the operation is performed for tumor of the bladder. The greatest safety to the patient when so affected lies in free drainage, and hence the operation suggested by Belfield, that of suprapubic cystotomy, combined with perineal section, offers the best chance for recovery, as well as of enucleating the growth.

As regards the technic of the operation, when it is possible it is best to occupy a week or ten days in putting the patient in proper condition. Rest in bed, attention to the digestion and bowels, light, easily assimilated food, the administration internally and application locally of such remedies as will have a tendency to sterilize the urine, are the means to be observed. Should the patient be old, feeble, broken down in health and strength, or anemic, there is nothing that is more beneficial than the inhalation of pure oxygen for a period of

half an hour, night and morning. For the operation the patient is, of course, to be prepared antiseptically in the usual manner.

The first question that presents itself is whether it is better to inflate the bladder with air or to fill it with water. I prefer the latter method, because when the bladder is distended with water it is not only a firmer object upon which to cut down, and hence easier to reach, but when the bladder has been incised the water escapes slowly, giving the operator abundance of time to enable him to insert his finger into the wound, thus plugging the outlet and stopping the escape of the fluid, and allowing an opportunity for examination of the viscus whilst it is partially distended, which is often of great advantage. On the other hand, when air is employed, the moment the bladder is penetrated the air rushes out, the organ collapses, and if the incision has not been made sufficiently large the opening is lost, and, as I have witnessed on more than one occasion, much precious time is consumed in discovering the opening.

The extent to which the bladder can be distended with safety depends on its capacity, as determined by distending it with water before the patient takes the anesthetic. This will be found to vary from two to sixteen ounces. As a rule eight ounces is amply sufficient, and is all that is required. The operation can be performed very readily when the rectal bag is employed if only six ounces have been injected.

After somewhat extended experience with the rectal bag, I have arrived at the conclusion that the operation can be performed more speedily, and with greater safety to the patient, when that appliance is used. When the bladder has been distended with water, the rectal bag lifts the viscus from the pelvic floor and presses it firmly against the abdominal wall, and at the same time pushes the peritoneum out of the way. Distention of the rectum, without dilating the bladder, merely elevates the base of the organ and does not raise it to any extent; nor does it thrust the abdominal fold of the peritoneum

aside. When both rectum and bladder are moderately distended the operation is performed with more facility, more speedily, and with greater safety. When pressing a full bladder firmly against the abdominal wall by distending the rectum, the surgeon is saved from making a greater lateral dissection of the prevesical fat than is absolutely required to reach the viscus, thus preventing in a great measure the danger of infiltration of urine into the adjoining structure.

Time is thus saved, which is a very important factor in the case, especially in operating on old or debilitated persons. With bladder and rectum distended, the viscus should be opened in from three to five minutes after making the incision through the skin. In many cases of vesical calculus, I have removed the stone and closed the wound in from eight to ten minutes after making the incision. The rectal bag should never be distended beyond *ten ounces*.

Finally, when the rectal bag is employed, if the operation be for the removal of stone, tumor, or diseased prostate, the base of the organ is lifted well up from the pelvic floor, when the work can be done with much more ease than if this precaution be omitted, as the *bas fond* is more nearly within reach of the index-finger. Hence, the natural conclusion is that the rectal bag should not be dispensed with.

As a rule, I place the patient on a perfectly flat, hard, horizontal table, and seldom employ the Trendelenburg position unless the patient is very corpulent, or the bladder so contracted by disease that it will hold but a few ounces of water, and this is necessarily very deeply seated in the pelvis.

We have a choice between two incisions—the vertical, and the horizontal, suggested by Trendelenburg. I usually prefer the vertical, and find it more satisfactory in the average case. The horizontal incision is better adapted to cases in which the individual is very stout, or when the bladder is contracted and incapable of much distention.

A small incision, from two and a half to three inches in length, is made, beginning

at the top of the pubic bone, extending upward in the median line, dividing the skin, superficial fascia, and sheath of the recti muscles. The incision can be lengthened if necessary. As soon as the muscles are exposed, the *linea alba* is looked for, the muscles separated by means of an Allis dry dissector, and the index-finger of the right hand passed into the wound, and carried directly down to the pubic bone, where the attachment of the fascia is very slight and can be easily torn through. The fascia is then drawn upward, together with the prevesical fat and the fold of the peritoneum, if it be present. Retractors are now inserted, and the sides of the wound widely separated, and an ocular inspection of the bladder made to determine whether or not the peritoneum and fat are well out of the way. When this is decided a tenaculum is passed *transversely* to the muscular fibers of the bladder and held by an assistant. The operator then passes his index-finger down in front of the tenaculum and rests it on the wall of the bladder, while with the right hand he carries a bistoury along the index-finger of the left hand as a guide, with the back of the knife to the tenaculum, directly into the organ, making an incision large enough to enable him to insert the index-finger of the left hand as the knife is being removed. By means of hemostatic forceps on each side of the incision, the walls of the bladder are grasped by an assistant holding the instrument, and the surgeon proceeds with whatever operation has to be carried out.

When the operation is completed the rectal bag is removed, and a large-sized rubber drainage-tube is inserted into the bladder, care being taken to carry the tube to the bottom of the organ when it is to be stitched in place. The wound is then closed; the suture (silk-worm-gut) must include the recti muscles. The incision should be closed up close to the drainage-tube. The tube is then carried to a vessel under the bed, in order that the contents of the bladder may be constantly carried away and the patient kept dry. Much discussion has arisen as to whether this method of drainage is satisfactory,

the objection being that it is not in accordance with the laws of physics. I have employed it in all my operations, and have never known it to fail. In order to drain properly, the end of the tube must rest on the bottom of the bladder, and the incision must be closed tightly around it.

To avoid extravasation of urine, and the development of sepsis, Senn has suggested that the operation be divided into two stages: First, cutting down and exposing the bladder, and then packing the wound with iodoform-gauze for five days. At the end of this time the bladder is to be incised in the usual manner. I have not found it necessary to do this, as I have never met with any of the evil consequences of infiltration of urine, and infection of the edges of the wound to which Senn refers. If drainage is properly employed in the manner that I have indicated, no evil consequence will ensue.

If during the operation the peritoneum should unfortunately be cut, it should be immediately closed by means of a Lembert suture, the bladder exposed in the usual manner, the wound packed with iodoform-gauze, and the viscus incised on the fifth day, after the manner suggested by Senn.

Regarding the application of sutures to the bladder after an operation, I have resorted to the method in five cases, four times with success. I do not think that sutures should be applied if the organ is contracted, or the walls thickened from disease, with marked cystitis, or if putrid

and alkaline urine be present. After the suture is applied, a small-sized drainage-tube is placed on top of the organ and brought out through the skin-wound. This acts as an indicator; should there be any leakage of urine through the cut in the bladder, it will show itself through the drainage-tube on the dressings, in which case the sutures should be immediately removed, and the wound opened and allowed to granulate. The drainage-tube is usually removed on the third day.

With the experience and success that I have had in suprapubic cystotomy, I am forced to the conclusion that the suggestion that I have offered in reference to the technic of the operation must be correct, and the probable reasons for the large mortality in the hands of other operators are:

1st. Want of proper preparation of the patient. 2d. Over-distention of the bladder, due to a want of knowledge on the part of the operator of the capacity of the organ in its diseased condition. 3rd. Non-employment of the rectal bag; or 4th. Over-distention of the rectal bag. 5th. Extensive and unnecessary dissection of the prevesical tissues. 6th. Want of proper adjustment of a drainage-tube of sufficiently large caliber. 7th. Injury of the peritoneum by the use of the knife after dividing the sheath of the recti muscles. 8th. Loss of time, after the patient has been etherized, in exposing the bladder, and a want of knowledge after the bladder has been exposed, as to whether the viscus is free from the peritoneal folds.

## DISCUSSION.

DR. M. PRICE expressed surprise at the high mortality recorded, not in Dr. Horwitz's own cases, but in the statistical records of the operation. Dr. Price has performed supra-pubic cystotomy three times for enlarged prostate and twice for stone, and he has been very much pleased with the operation in both instances. In the cases of stone, a diagnosis had not been made, although good men had seen them a number of times. No stone could be found, although all the symptoms of stone were present. In both cases the stone was encysted posterior to the urethra, and almost behind it. It was impossible when sounding to touch the stone at all. The bladder was opened above

the pubis for diagnosis, as well as treatment that might be necessary afterwards. Both patients recovered nicely without any trouble.

In regard to the operation for enlarged prostate, Dr. Price did not think that any other procedure can begin to offer the same chances of success with so little risk. In his three cases the patients are wearing the Hunter McGuire button, for the reason that the mouth of the bladder has been almost entirely obliterated. One was a man 88 years old; another 81. The older man was an old friend, and had not attended his meeting for four years, because he was kept almost continuously emptying his bladder. When seen by Dr. Price his bladder

was distended with three or four quarts of urine. The bladder was opened without any trouble, having been pushed above the navel, and there being no question of peritoneum it was perfectly safe to go directly in and empty.

Dr. Price did not believe that any drainage of the bladder, immediately after an operation, should be trusted to the drainage-tube itself. The tube is best made of rubber, because this does not irritate as much as glass. It should be emptied, not by gravity, but by syringe, and for a sufficient number of hours to avert extravasation. In the two cases of stone and enlarged prostate, Dr. Price opened the peritoneum, which gave him no especial anxiety. He used no rubber bag, no artificial means whatever; nor did he inject the bladder, but he simply went in, and brought the bladder up to the abdominal wound, protecting the peritoneum by gauze, whip-stitched the bladder around to its peritoneal border, and then put in not only a rubber tube, but gauze, packing the wound just at its union with the peritoneum.

In neither of these cases was there any trouble. It was quite a while before the wounds granulated and the patients could use the button. The drainage should be attended to by the nurse, and emptied with a syringe. In opening the peritoneum Dr. Price recommended, after the skin, fat and tissues down to the linea alba have been incised, the use of forceps, going down, picking up tissue and pulling it forward until the bladder is reached. In this way it should not take a man more than one and a half minutes to get into the bladder, while all need of a rubber bag in the bowel is obviated.

In regard to the supra-pubic operation for stone, Dr. Price felt so sure of the method being safer even than crushing, that if he had a stone in his own bladder he should insist upon its removal by the supra-pubic route. He would rather have an inexperienced surgeon cut down on his bladder from above and remove a stone, than permit a skilled hand to do so by crushing.

Dr. Price thinks castration for enlarged prostate uncalled for and unsurgical, and he does not believe that it will do all that is claimed. He referred to the case of an old man, 83 years of age, whose prostate was as large as two fists, and who lived four years after supra-pubic cystotomy, and then died of pneumonia. He could carry his water for three or four hours, the operation having given relief to the cystitis and the irritation.

Dr. JOHN B. ROBERTS said that supra-pubic cystotomy is in itself almost free from danger. Of course there may be complications attending prostatectomy, such as diseased kidneys, perinephritis or pyonephrosis; but the operation is one of the easiest major procedures in surgery, and is certainly attended with a very low mortality. Ten or fifteen years ago, at the American Surgical Association, in a discussion on stone, the older men took the ground that the perineal was the best route. At that time Dr.

Roberts predicted that the lapse of ten years would probably see the high operation and litholapaxy the usual operations for stone, and this conclusion has now been practically reached. The suprapubic section is by all odds the best operation.

It is not necessary to use the rectal bag. The Trendelenburg position, with about eight ounces of water in the bladder, seems to give perfectly satisfactory results. Dr. Roberts has never used air, but always water. He has cut the peritoneum once, but without ill result. The membrane was sutured before the bladder was opened.

One objection to the bag is that it rather increases bleeding. Pressure in the rectum interferes to a certain extent with the circulation in the veins. Dr. Roberts prefers the vertical incision, unless the bladder is a very small one. The transverse incision affords a beautiful view of the bladder, but the objection is that the muscles slide up in their sheaths, and it is difficult to bring the upper and lower portions together in closing the wound. The suture should be put in the upper portion of each rectus muscle, above the intended line of suture. The thread will enable the operator to pull down the upper end after the division. Men report the dangerous cases, and not the successful ones. The successful ones are not reported because they seem so easy. The operation is an exceedingly good operation, and Dr. Horwitz has done a service in bringing forward the fact that the mortality ought to be very low.

DR. ERNEST LAPLACE believed suprapubic cystotomy to be the operation to be performed whenever a source of irritation is to be removed from the bladder, or when the bladder is to be put at rest, and that comprises all the affections of the bladder demanding operation. The operation was not held in good repute at the time it was first practised, because the principles that make all surgery successful to-day were then little understood, and chief among them, drainage. To-day it is precisely understood what drainage ought to be, and its common-sense employment, with a simple knowledge of the anatomy of the bladder, makes this operation free from danger. In a discussion before this Society some time ago, as to the relative importance of the two operations, litholapaxy and suprapubic cystotomy, the consensus of opinion, because of the report of a number of cases by Dr. Kerr, from China, was that preference would be given to the former operation when it could be performed. Dr. Laplace then maintained the opposite, *i. e.*, that the ideal operation on the bladder was the suprapubic, because a plain incision into the bladder, made in a cleanly way, is less grave than working in the dark, as in litholapaxy, the surgeon not seeing what he is doing. In the hands of the best men the mucous membrane may be grasped and lacerated, and one cannot be sure that all stone has been removed, leaving no nucleus for more. Dr. Laplace has done personally supra-

public cystotomy thirty-five times, and has lost but one case, occurring in an old man, who died of uremia. The operation was performed a number of times for stone, and a number of times for tuberculosis of the bladder. For giving the bladder a rest there is no operation to be compared with it. For enlarged prostate, Hunter McGuire's button is of aid.

DR. ORVILLE HORWITZ said that in several cases, in placing the drainage-tube in the wound and sewing it in place, he has put a suture loosely through the wound, and left it loose so as to tie it down after the drainage-tube was removed. He always removes the drainage-tube on the second day, unless he follows the Hunter McGuire operation. In this way one may be sure that the little opening will be closed at the end of from twelve to fourteen days, and no sinus will be left. Many operators state that they have difficulty in getting the suprapubic opening to close. This is due to leaving the drainage-tube in too long. Leaving a loose suture in, and removing it on the second day, has not proved successful. Stitching the edges of the bladder is very well in the Hunter McGuire operation, but in ordinary cases this is not a necessary procedure, and may be regarded as a waste of time. The drainage-tube applied in the way described has been all that is necessary.

It is not advisable to pick up the tissues over the bladder, after the recti muscles have been separated by hemostatic forceps, and then divide them, layer after layer, until the bladder is reached. The knife should not be employed after the sheath of the recti muscles has been divided, until it is desired to puncture the bladder.

In the case of the patient who had an enormously hypertrophied prostate, with stone in the bladder, it was impossible to introduce anything except a rat-toothed catheter, and that with a great deal of difficulty. The patient was told that it was probable that he had a stone in the bladder, in addition to his prostatic difficulty, and that the suprapubic operation therefore was necessary. He was an enormously stout

man, and not only a vertical incision was made, but also the incision of Treves, cutting muscles on both sides. When the bladder was opened a large part of the prostate was removed in the usual way. Six calculi were found, weighing together six and a half ounces. The hemorrhage was very profuse.

A portion of gauze was packed down into the wound. By the electric headlight it could be seen that the ureters were not blocked, and the gauze was allowed to remain four days. At the end of this time the patient was etherized again, and the packing was removed. The edges of the wound were curetted and approximated, and a drainage-tube inserted. This was replaced in three or four days by a soft rubber catheter. In a few days nice recovery followed. Therefore, if there is any tendency to the formation of a permanent fistula the patient should be put to bed, a soft rubber catheter should be inserted, and the wound touched with silver nitrate.

The bladder can be opened without the use of the rectal bag; but with it distended with water the bladder is rendered more accessible. After the bladder is opened, and further interference is required, the floor of the viscus, instead of being deeply seated in the pelvis, is lifted well up, and manipulation is facilitated. The use of the bag does give rise to a little more hemorrhage in the walls of the bladder, but with ocular exploration the vesical veins can, as a rule, be avoided, and as soon as the water escapes from the bag the hemorrhage ceases. The rectal bag is, therefore, a decided advantage. If, however, the bladder is merely to be drained, as in case of retention of urine due to hypertrophied prostate, or in the operation for Hunter McGuire's button, the rectal bag is not needed.

Dr. Horwitz expressed the conviction that the crushing of stones in the bladder is a very dangerous procedure in the hands of the general surgeon, and even in the hands of the specialist as a general thing. As a rule the safest operation is suprapubic cystotomy in cases of vesical calculus. If the stone is small and the kidneys healthy, crushing would be indicated.

## REMOVAL OF A SARCOMATOUS THYROID GLAND WITHOUT AN ANESTHETIC—IMPENDING DEATH FROM SUFFOCATION.

GWILYM G. DAVIS, M.D., M. R. C. S. Eng.

[Read April 28, 1897.]

A man, aged thirty years, came complaining of a tumor of the neck, and the following history was obtained: He said that he was well until three months previously, when he noticed a small swelling on the front of his neck. This remained small until six weeks prior to his admission to the hospital, when it began to increase in size; during the last three weeks this increase was very rapid, indeed. The growth had not occasioned much pain, but recently difficulty in breathing and in swallowing had developed. The voice became hoarse and there was some cough. Pain was felt in the neck and around the shoulders. Examination revealed a tumor the size of an orange, round and tense, but with a feeling of apparent fluctuation. It was somewhat tender to the touch. The median line of the growth was slightly to the left of the median line of the neck, and the tumor reached from the supra-sternal notch to well up on the thyroid cartilage. It moved somewhat on swallowing, but was evidently attached to the surrounding tissues, thus preventing free motion.

A casual examination caused me to regard it as a tumor of the thyroid gland, and from its extremely rapid growth and obscure fluctuation, possibly largely cystic in nature. At all events I decided to incise and evacuate such cysts and portions of the growth as would tend to liberate the imprisoned trachea, and thus relieve the breathing. It was proposed to use ether as the anesthetic, provided it was well borne; if not, then chloroform. On beginning the administration of the ether the breathing became labored. The anesthetic was immediately removed and

the patient allowed to sit up on the operating table, with the expectation of the breathing becoming better. Instead of doing so it became worse. The man's face became pale and his lips blue; the air could plainly be heard hissing in and out of the constricted air-passages.

It soon became evident that the breathing was not going to improve and that if relief was not given the patient would die in a few minutes. The man was then induced to lie on his side, with the head and shoulders raised, and an incision was made into the tumor. Only blood came, and the finger revealed a solid but soft growth. The dyspnea becoming more urgent an incision was then made at the upper edge of the tumor, and rapidly deepened until the hyoid bone was felt. It was intended to cut down and see whether an opening could be made into the trachea above the growth, and thus allow of a tube being passed downward beyond the obstructed part, and enable the patient to get some air.

It became evident that the growth had encroached so high up on the larynx that an exposure of the lower border could only be obtained by cutting through the whole thickness of the tumor, a proceeding that in itself might have proved fatal from hemorrhage; so, with the idea of relieving the pressure of the tumor on the trachea, the incision already made was prolonged downward to the supra-sternal notch and deepened with a few strokes of the scalpel until the tumor was exposed. Two hemostats served to hold the tissues apart, and, grasping the growth with forceps, it was pulled forcibly up, away from the trachea. This seemed to improve

matters somewhat; so, handing the forceps to an assistant, the soft parts were rapidly dissected aside, the thyroid arteries and veins clamped and the whole growth loosened from its attachments, proceeding from below upward, and removed. A small piece of the right lobe was allowed to remain. It was connected by a flat fibrous band to the growth, which arose from the remaining portion of the gland.

So soon as the tumor was raised the trachea was seen compressed and pushed to the right side. The patient, who by this time was almost dead, began breathing again and soon was perfectly sensible. Comparatively little blood had been lost. A drainage-tube was inserted at the lower angle of the wound, and the remainder closed with interrupted sutures. Recovery from the operation was prompt, the drainage-tube being removed on the fourth day, leaving a granulating spot, half an inch in diameter, and the patient was soon up and around the ward. There was slight suppuration around a couple of the upper stitches, due to infection of the wound by the patient picking it and thrusting his fingers under the edge of the dressing. The neck, instead, however, of remaining soft, soon became hard and brawny, and the drainage-tube opening, instead of healing, became the seat of a recurrent growth. The tumor that had been removed was a grayish-white mass, possessing in some places a fairly distinct capsule; at others, however, it was adherent to the surrounding tissues, which were evidently affected by the malignant process, but not to such an extent as to enable it to be appreciated by the sense of touch. By the end of the third week after the operation the recurrent growth at the site of the drainage-tube opening was quite large. The breathing again became much embarrassed, and another attempt at relief became imperative. Chloroform was administered and a mass the size of an egg removed. This was only partially encapsulated, was very soft and broke into a pulpy mass, which had to be scooped and curetted away. The neighboring tissues were everywhere infiltrated.

Some relief followed this operation, but

within a week the growth again appeared at the site of operation, and on the ninth day, early in the morning, the patient had an attack of dyspnea, went into convulsions and died in a few minutes. Post-mortem examination by the pathologist, Dr. Stengel, revealed a malignant growth extending from the sternum, below, to the tongue, above, and from the vertebral column, posteriorly, to the skin, anteriorly. The large blood-vessels of the neck were imbedded in the mass of the tumor; the trachea was pushed to the side and compressed; and the esophagus, also involved, lay flattened by the mass against the vertebral column. Search was made for a point of rupture into the veins, but none was found. The lungs were also affected. Microscopic examination showed the tumor to be a spindle-cell sarcoma, with some, but not many, round cells.

There are few things in surgery that are so terrible and demoralizing to a surgeon as to have a patient in apparent robust health die on the operating-table. Should death take place soon after, or even during, an operation on a case *in extremis*, like those suffering from intestinal obstruction, then one would not feel so badly, because the contrast between life and death is not so marked, and one's own responsibility not so evident. In the case just related the patient had been up and walking around the wards conversing and associating with the other patients, and his sudden death would have been directly attributable to the operative attempts. Twice before have somewhat similar events occurred to me. While resident surgeon in the Pennsylvania Hospital, serving under the late Professor Agnew, a young girl was admitted with a nasal polypus. I was entrusted with its removal. All attempts to effect this by grasping the formation with forceps and trying to draw it out failing, ether was given and another effort made. In this the pedicle broke and the tumor slid back into the pharynx. The patient stopped breathing at once, it being impossible for any air to enter, became blue and seemed at the point of death. Hastily turning



her on her face, with the head hanging over the edge of the bed, a vigorous thump on the back dislodged the obstructing body and out came an enormously large, soft polyp.

The third case occurred last year. My resident was instructed to operate for circumcision on a boy about nine years of age, in an adjoining room. The operation was satisfactorily performed and finished, when, hearing a commotion, I entered and found the patient in the throes of asphyxia. The face was congested, the lips blue, the teeth clenched and the mouth covered with vomited matter. Realizing the state of affairs, the jaws were pried slightly apart with the hands, and thrusting a forefinger between the teeth, I succeeded in dislodging a piece of meat that was impacted in the opening of the larynx. The patient was lying face down, with the head over the edge of the bed, and slightly drawn back. The obstruction was no sooner removed than attempts at respiration induced vomiting again, and again was it necessary to clear the fauces with the finger. This continued for several minutes, and not until the stomach had been emptied of its contents did the asphyxia disappear and the natural color of the face return. This patient was as near the dividing line between life and death as the other two patients, and I trust to be spared a repetition of the experience.

The first case illustrates forcibly the irritating effects of ether on the respiratory passages. It had been intended to discontinue the ether if not well borne and substitute chloroform, but the effects of the irritation caused by the ether did not disappear on its withdrawal, and it was necessary to operate without any anesthetic. This serves to demonstrate the fact that ether is not always the most suitable anesthetic. Cases arise in which one should either employ chloroform or no anesthetic at all. In this country the objection to the use of chloroform is so strong that many physicians never have used it, while others resort to it only in very rare cases. Personally, I believe that most of the objections that have been urged against

it are well founded, and that it is a treacherous agent, with a powerfully depressant effect on the circulatory system. Whenever it is possible to do so I use chloroform only to induce anesthesia and then substitute ether. In the surgery of the respiratory passages ether is particularly objectionable. When there is inflammation or a tendency to edema, then the irritating effects of the ether will, either by directly aggravating the existing condition or by inducing an outflow of tenacious mucus, cause interference with the breathing. In the case cited the dyspnea was thought to be due more to narrowing of the lumen of the trachea by direct pressure of the tumor than to inflammatory swelling or edema, and that was why it was decided to try ether. The fact of the dyspnea progressively increasing even after the ether had been withdrawn shows how persistent its evil effects on the respiratory passages are. The use of an anesthetic also predisposes the patient to septic pneumonia. In other operations on the air-tracts, as in tracheotomy, I usually operate without an anesthetic, or else administer chloroform until consciousness is lost and then rapidly complete the operation without it. In cleft palate I have used both chloroform and ether and am not entirely satisfied with either. Perhaps a combination of the two, as suggested by Dr. Mears, is best.

In the case of the nasal polypus attempts had been made to use a snare, but without success, and even had it been used the same accident might have happened. It is an occurrence that may take place at any time in the removal of large growths through the fauces. Had the thumping failed to dislodge the obstructing tumor my next move would have been to have introduced the finger to remove it.

The trouble in the last case was due to the child having eaten a hearty meal not long previously to the operation. He had been brought to the hospital for the operation and it was impossible to have him properly prepared. The case shows the danger of administering anesthetics on a full stomach. The main difficulty in this case was to gain access to the pharynx,

It is certainly common for anesthetics to be administered when no appliance is at hand with which to open the jaws. In European clinics, where chloroform is the anesthetic usually employed, it is customary to have ready for use a mouth-gag or forceps with which to pry or force the teeth apart in case of necessity. In this country many anesthetizers will have forceps at hand to pull the tongue forward, but nothing with which to pry the jaws open. In some cases the physician must gain access to the throat at all hazards and that quickly, or the patient will die. In the one here detailed, fortunately, we were able to force the teeth slightly apart, and, at the cost of a certain amount of laceration, push the forefinger into the

mouth. In the case of an adult and even of some children this might have been impossible and resort to tracheotomy would have been necessary.

We really have no very satisfactory manner of opening the jaws when firmly clenched. The various forms of forceps and gags devised by Roser and others, while efficacious, are likely to break the teeth.

Probably as good a means as any is to have a wedge of wood, about three inches long and an inch thick, and force this between the teeth. This is simple and affords sufficient space to grasp and draw forward the tongue or to introduce the finger and dislodge any foreign bodies that may be present.

## DISCUSSION.

DR. M. PRICE said that many surgeons take risks in performing, in their offices, operations requiring the administration of an anesthetic, and he cited a number of instances in which death unexpectedly took place under these circumstances.

DR. HORACE K. REGAR said that the late Dr. Goodell used to insist that it was impossible for the tongue to slip back in the throat, and any one who will attempt the experiment in his own person will be able to verify the truth of the statement.

DR. FRANK WOODBURY said that Dr. J. Solis-Cohen has called attention to the liability of incarceration of the epiglottis in the throat by the constrictor pharyngei muscles. The belief that the tongue may fall back into the throat, and become an obstruction to breathing, is so general that there must be some basis of fact for it. Dr. Woodbury emphasized particularly what was said about the administration of anesthetics in offices of physicians or dentists, and called attention to the fact that many deaths from anesthetics occur in dental practice, dentists being in the habit of giving the anesthetic in their operating chairs. It is a mistake to assume that the danger from an anesthetic is reduced by the fact that it is administered for a minor operation. It was formerly taught that the great distinction between ether and chloroform is that the latter is a vaso-motor depressant. It is true that this feature of the physiologic action of chloroform is very prominent. The vaso-motor paralysis occurs early in the administration, so that after the inhalation of a few drops of chloroform serious vaso-motor paralysis may occur. Thus the practice of administering a few whiffs of chloroform

to initiate anesthesia, to be followed up by ether, is not without danger. There are certain patients to whom ether is a depressant, and in the case first reported by Dr. Davis the Nelaton position would be a proper one in which to have treated the patient, instead of having him sit up on the operating table. In that case the ether had acted as a vaso-motor paralyzant, and the alarming condition of the patient was due to possibly this cause, although the mechanical obstruction to breathing that was present may also have played a very prominent part.

The risk of anesthesia from ether will depend largely on the quality of the ether employed. The use of inferior qualities has brought ether into disrepute in England. There are many surgical operations that can be done in a short time, in which an anesthetic is not necessary, and it is time that the profession took a stand on this point, and ceased to encourage patients to take anesthetics for trifling operations. No case of coma produced by an anesthetic is devoid of danger, and many of the minor operations can be done without disturbing the consciousness of the patient.

DR. S. SOLIS-COHEN said that he has seen a great many operations on the air-passages in the practice of Dr. J. Solis-Cohen, who lays great stress on the necessity of operating under these conditions without a general anesthetic, unless it be absolutely imperative. In one case there was a large malignant tumor of the thyroid, pressing upon the trachea, and the operation proposed was a tracheotomy beneath the tumor. Upon opening the trachea a great gush of blood occurred, and the patient was almost suffocated by the blood flowing into the windpipe by reason of the wall of the trachea

itself having been infiltrated by the tumor. The hemorrhage came from some large vessel cut in the incision for the cannula. That patient, being conscious, could be raised and could assist, by efforts at coughing, in getting the blood out of his trachea, while a retractor was inserted and pressure made on the bleeding point. In this case there would probably have been instant death if the patient had not retained consciousness.

DR. G. G. DAVIS said, in regard to the performance of operations in one's office, that the surgical dispensary can be compared to one's private office, and it is positively necessary at times to do operations in these dispensaries because the cases are not of sufficient gravity to be admitted to the house, yet requiring treatment, such as cases of phimosis. The difficulty would hardly be avoided by the administration of ether after making sure that the stomach is empty.

As to the question of the tongue falling back, whether it be the tongue or not does not matter much. The epiglottis certainly does at times, and it can be raised from the opening into the larynx by certain positions of the head or drawing tongue forward. Dr. Davis is not so much alarmed at the obstruction to breathing that comes from the tongue, because his experience leads him to believe that it is ordinarily not dangerous, that is to say it does not persist to

the point of seriously threatening life; but he fears the effects of the other causes, such as tumors, blood and the like. Dr. Davis considers the primary administration of chloroform as dangerous. He agrees with the statement that, as has been shown by many reported cases, death is liable to occur after the first few whiffs of chloroform; but there are many cases in children in which it is perfectly justifiable to run the risk of death from chloroform by administering the chloroform simply to quiet the child, at least to begin the operation. In one of the cases reported the patient, as soon as the ether was removed, sat up on the table, and, as it would have been rather awkward to attempt to remove a large sarcomatous thyroid gland with the patient in this position, a support of pillows a couple of feet in height was made, on which he reclined on his side. Then, as the incisions were made, the blood flowed forward and away from the field of operation.

The whole question of operation on the air-passages hinges largely on the question of not using any anesthesia at all. That is Dr. Davis' preference, but practically one is compelled to use anesthesia in some cases. In cases of extensive cleft palate the denudation to the bone is sometimes such a long and troublesome operation that it is but just to the patient to employ an anesthetic, and it can be used without danger also in other extensive operations, for instance, those on the jaws.

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## THE HOT-AIR TREATMENT OF GOUT AND RHEUMATISM.

A. GRAHAM REED, M.D.

[Read April 28, 1897.]

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I would like to call attention to the effects of the application of highly-heated, dry air in the treatment of chronic rheumatic and arthritic cases of long standing; not but what acute ones are relieved, but that the results in the others seem more remarkable.

The use of heat as a remedial agent in rheumatism and gout is by no means new, for nineteen hundred years ago the Pompeians employed hot air for the alleviation of those diseases now classed under the head of lithemia. Then, too, the early

Romans, to the number of 25,000 daily, patronized the luxurious baths of Caracalla, the caldarium being considered an important factor. They were not the poor or the ignorant, but the rich and the middle intelligent classes, who took the hot-air treatment, lying upon marble slabs covered by rugs or matting. They were then massaged, and afterwards rubbed with perfumed oils. All this, however, did not prevent them from contracting chronic forms of those diseases, with their attendant deposits and deformities, or

from transmitting the tendency, through long ages, to their descendants throughout the capitals of Europe, and, later on, of America. It is quite well established that those Romans, who took active physical exercise, did not suffer to any great extent, and in our own day, our oarsmen, baseball and football teams, and bicycle riders are tolerably exempt.

I scarcely think that the inhabitants whom Columbus found here had the lithemic tendency. They did not have the knife and fork, the tea-cup and saucer, or the deadly sugar-bowl. They lived in the air and sunshine, and tore their food with their teeth, which remained sound and firm, and did duty for a lifetime. It was not a refined style of table-manners certainly, but they had no gastro-intestinal disturbances, which lead to lithemia and all its baneful consequences.

It is only in this nearly twentieth century that attention is being paid to proper mastication; that we are taught how to eat properly, so that the ferment in the saliva may break up the starch-granule, and thereby aid digestion; and that we must chew our milk as well as our bread. It is proved, too, that living largely upon nitrogenous food increases the amount of uric acid in the blood. Under proper methods this may be excreted, and thereby cause but little injury to the system; but in living a life of ease, and in *not* earning his livelihood by the sweat of his brow, the individual surrounds himself with luxurious conditions conducive to its production and retention, and lays the foundation of those diseases of nutrition characterized by imperfect oxidation of the tissues. If the accumulation of this uric acid be confined to the liver, spleen or other organs or tissues, it causes local disease; but when swept into the alkaline blood, it produces a general lithemic condition.

Occasional deposits may occur by an excess or error in diet, without much disturbance of health.

The exact mode of production of uric acid in the body is still a matter of uncertainty, but, according to the majority of workers in this field, it is undoubtedly

associated with nitrogenous metabolism, and the acid represents an imperfectly oxidized form of nitrogenous material. Its final destination is its conversion into urea, but, for lack of oxidation in the tissues, this process is checked.

Haig has told us that continued retention of uric acid in the blood is incompatible with healthy function. Let there be a change of weather, and the patient be ever so slightly chilled, the uric acid is thrown down, and deposits are made in the vicinity of joints and elsewhere, and he suffers from an attack of gout. The acid accumulates through faulty metabolism. We then find acid dyspepsia, and other disorders of digestion, while disturbances of the nervous functions, and of the circulatory system in general, exhibit prominent features of the arthritic diathesis. Congestive headaches, neuralgias, vertigo, sciatica, depression of spirits, hot hands and feet, hay-fever, asthma, bronchitis, cutaneous eruptions, muscular rheumatism and gout, are all due to a lithemic condition. Loss of sleep, intellectual or physical fatigue, the continued use of beer, wine or articles containing dextrin, sugar, etc., favor the deposit in the tissues of those having a lithemic inheritance.

As age creeps on, deranged conditions of digestion ensue, and, in fact, the tendency, once acquired or inherited, remains for life.

Foul breath, coated tongue, constipated bowels, headache, bad temper, nervous irritability, tenderness over the liver, flatulency, sometimes gastralgia, occipital headache, throbbing at the temples, are all symptoms that we meet with in our every-day life among business men, who indulge in too much meat, sugar, coffee, tea, tobacco, starchy foods, beer or wine, or both, and who have an insufficient amount of open-air exercise for carrying on the metabolic functions, and for aiding the free excretion of uric acid and urea. Very often we find the individual suffering from a rheumatic fever, or an acute attack of the gout, which serves to clear the organism by the rapid oxidation which goes on in the tissues surrounding the joints. This disposition of the salts has been made a

matter of certainty, through the use of the skiagraph.

To prove that nature is making an effort to relieve in these cases, we have only to make Garrod's test by putting filaments or threads into serum taken from a blister. After many hours the threads will show the deposit of uric-acid crystals, while if the serum is taken from over the joint, there will be no uric-acid deposit upon them. The acid has been oxidized by nature's process, and sodium urate is left. In this way we may explain the disappearance of uric acid from the blood, as the attack culminates and the organism is cleared temporarily. The storm is over for the time being.

If, however, we have repeated attacks, and if, through age, we have less power to throw off existing conditions, the subsidence of the disease will be less complete. Oxidation will be only partial, deposits will continue, and at last we have the conditions known as chronic gout. Then uric acid is constantly stored up, the infiltrated tissues undergo a secondary process of inflammation, and articular ankylosis is developed. We have also muscular atrophy as a consequence of the defective nutrition.

Many of the so-called nervous prostrations and neurasthenias afflicting overworked men and women are really nothing more than cases of lithemia, induced by faulty metabolism, through the want of having time or of knowledge of how to live and exercise correctly. Each case of this kind should be made a special study, as each is a law unto itself and needs individual care as to diet and general methods of living.

Haig says, further, that diet is of the first importance, and I think that exercise in the open air should come next when possible. I have found that my cases of asthma, bronchitis, hay-fever, tonsillitis and kindred diseases are mainly due to lithemia. Many of the patients so afflicted have a disgust for water and seldom drink it. They only use it when made into tea and coffee as a beverage with which to wash down their food, and it must be sweetened with a large quantity of sugar.

It is my practice to require them to drink as much pure filtered water as possible, before and after meals.

Exercise increases the oxidation of the uric acid and eliminates it from the system, and I know of nothing better for the purpose than the proper use of the bicycle. By rapid motion in the open air, the lungs are filled with the necessary oxygen, resulting in oxidation of the blood and the uric acid in it. The circulation is increased in parts in which it has been deficient, and they are thereby strengthened. I also consider bicycling a mental and physical discipline which improves the nervous system of the poor lithemic patient.

Lithemia is now an all-prevailing disease, and physicians are looked to for help. We must remedy the existing evil so far as possible and educate the people to prevent its progress. Certain constitutional remedies have been found very useful, and dry hot air of an extremely high temperature is a powerful therapeutic adjunct. For its successful application, I have had constructed a copper cylinder having many advantages over those seen in the London hospitals. With this American apparatus I am able to apply and easily regulate hot, dry air ranging as high as 320° and even higher, for from 40 to 60 minutes, that being the time allowed for a single treatment. The temperature of the body in some cases remains normal or nearly so, and in others varies up to 100°. The pulse ranges from 80 to 104, the latter the highest I have yet seen.

The first effect is upon the peripheral circulation and the terminal nerve-filaments in the skin. Under the stimulus of the hot air, the cutaneous blood-vessels first contract and then relax, thus causing profuse diaphoresis. The circulation is enormously increased and the color of the skin becomes a vivid red. Pain and stiffness are greatly diminished and, in time, entirely relieved. The anodyne effect is very great at a temperature of 300° and upwards. Many prefer it at that height as being so comfortable. When fibrous articular adhesions have formed, more speedy relief is found by breaking them up under chloroform and then applying

the heat. I have not yet seen any injurious effects from this treatment, but I have seen cripples give up their crutches and useless hands become useful. Pain and effusions have disappeared and even parts not directly treated have been in a measure relieved.

It is greatly a matter of patience and perseverance and intelligent appreciation on the part of the patient and of his or her proper management, attention to diet and daily habits, by the physician. Miracles must not be expected; nature takes time for her recuperative processes and the patient must be made to so understand this. I beg to cite herewith a few cases:

Mr. B., aged 63 years, had been on crutches for six months in consequence of an injury to the leg and ankle. After the third treatment he discarded the crutches for a cane, and at the fifth, he came without any support whatever. After that he walked forty-five squares and thought on reaching home that his ankle felt a little weak and so came for the sixth treatment, after which he walked four miles.

Mrs. C., aged 53, had rheumatism for many years, and her mother had been a sufferer from the same complaint. She could not stand erect or bend the knee without great difficulty. She had to be assisted in and out of bed. She had no cardiac lesion, nor had she been laid up with fever. After the first application of the highly heated air, at  $260^{\circ}$  for one hour, the leg could be easily flexed and much soreness had disappeared. After the second treatment the entire soreness was removed, and upon the sixth she was discharged perfectly well.

Mr. H., aged 64, a case of obstinate sciatica, was cured in one treatment at a temperature from  $212^{\circ}$  to  $222^{\circ}$ .

Mrs. A., 47 years old, has had rheumatism for several years. Her right elbow was ankylosed at nearly a right angle, the left not so badly so. She could feed herself with difficulty, but could not dress or undress herself. There was considerable thickening of the joints of the thumb and fingers. The muscles of the arms were much wasted; one knee was sore and stiff

and the leg muscles were atrophied and bound down by deposits. She had no cardiac lesion, but had suffered from inflammatory fever. After three treatments, she regained some of the movements of the arms and hands, and after the fifth, at a temperature of  $312^{\circ}$ , she surprised her maid by dressing herself. She has now nearly the full use of her arms and is constantly improving, to her great delight.

Miss R., aged twenty-four, suffered from writer's cramp in consequence of intense neuritis of the thumb and forearm due to rheumatic deposits. The muscles of the thumb and wrist were very much puffed and swollen. There was severe pain upon use of the pen, the patient being a cashier and accountant. The first treatment took away all the swelling and soreness. After the fourth she considered herself cured.

Miss B., sixty-three years old, is a case of rheumatic gout of twenty-four years' standing. The joints were all more or less enlarged, the knees measuring twenty-two and one-half inches round. There was great infiltration and constant pain, with grating sounds upon motion. It was impossible to move or turn herself in bed without help. She could only get about with the aid of crutches, and then with the greatest difficulty. The muscles of the leg were very weak from want of use, being for many years bound down by adhesive inflammation. The ankles were swollen and very sore. The elbows were enlarged and painful. The fingers were much out of shape. This patient was carried to and from her carriage in a chair on the occasion of her first visit to the office, but the size of the knee diminished one and a half inches after the first application of the heat. After that she discarded the use of the chair. She takes daily treatments, and the knees are now reduced two and a half inches in size; the pain and soreness are passing away. She can turn and help herself in bed. The outlines of the patella can be defined and the grating sound is not so marked. She bears a temperature of from  $250^{\circ}$  to  $290^{\circ}$  and improves each time. This case has never been amenable to other treatment

and has steadily grown worse. The patient is an intelligent woman and knows that the process is a slow one; but from the relief already experienced she bases great hopes of being restored to comparative comfort.

Without citation of further cases I can

only say that so far the use of the improved American cylinder has been highly successful, and I thoroughly believe that in the treatment of the various chronic lithemic conditions more can be accomplished by this method, properly managed, than by any other means.

## DISCUSSION.

DR. G. G. DAVIS said that when the English apparatus was brought to this country some excessive price was demanded for its loan or rental. Satisfactory substitutes, however, have been made which can be bought at reasonable prices. There is no doubt at all as regards the efficiency of the process. Its effects are marked, and it promises to be a rival to massage in the treatment of stiff joints. Dr. Davis cited the case of a man with stiffness following fracture, whom he instructed to make a copper cylinder about one foot in diameter, and sufficiently long to encase the hand and forearm to the elbow. The air-supply was regulated by a stop-cock, and one end of the cylinder was closed with copper, while the other end was provided with a wooden rim, about which was tacked an ordinary piece of thick woolen material. The cylinder was rested on a wire frame, and beneath it was placed a plumber's lamp. A Bunsen burner would do, but the plumber's lamp gives greater heat. Inside of this chamber, on a false bottom, was a piece of asbestos cloth, and the hand and forearm were covered with cotton, in the folds of which was placed a thermometer, and the woolen material tied around the elbow. The man was thus enabled to obtain a temperature of 350°, which he could maintain for from half to three-quarters of an hour. The improvement following the treatment was very marked. One of the objections to the method of treatment is the time that it consumes. Beside, somebody is required to attend to the apparatus, either the doctor himself or a trained assistant. He must be there during the entire period of administration to regulate the heat, and the time consumed is almost prohibitory so far as public patients are concerned. No doubt means will be devised by which the apparatus can be used more extensively than it is now, with consideration of both the cost and the amount of time involved in employing it.

DR. J. P. ARNOLD said that he has been treating two patients at the Presbyterian Hospital, with a very simple apparatus, since early last fall. One had a gouty arthritis of the knee, which had existed three years. There was fibrous ankylosis of the joint. The apparatus consisted of a copper cylinder 18 inches long and 16 inches in diameter, with perforations along each side to allow a current of air to pass through. The ends of the cylinder were fitted with wooden discs, with central openings of

various sizes to fit different-sized limbs. Around these central openings pieces of mackintosh cloth, provided with drawing-strings, were tacked. A small hole was made in each disc, so that a thermometer could be placed in the apparatus. With two alcohol lamps a temperature of from 260° to 300° F. could easily be maintained. In all the patients under observation there was very marked improvement, though it was slow. The cylinder is now being used on three or four patients in the wards of the hospital, and all are being benefited. The actual cost of the apparatus described would probably not be more than \$1.50. It was made by the hospital tinsmith.

DR. S. SOLIS-COHEN said that the range of the therapeutic efficiency of the apparatus is a matter of doubt in his mind. The so-called Turkish and Russian baths do not fulfil the entire purpose; and there appears to be a considerable field of usefulness for the apparatus exhibited, as the reports of cases go to show. It is only by experience, however, that it will be learned which cases can be benefited, and which not. The simpler methods, of course, are preferable, because they can be carried out anywhere. It is necessary that the physician himself should superintend the administration of the hot-air baths for at least half-a-dozen times. Later they may be entrusted to a very well-trained assistant. Patients may be severely burned by attempting to apply the treatment themselves.

DR. A. GRAHAM REED said, as regards the use of the cheaper instruments, that he did not know but that they will afford good results, gotten up as they are, but from his observation he thought they will often prove failures. One fault of the Tallerman-Sheffield cylinder is that it is not properly lined so as to prevent the limbs from coming in contact with the metal. Dr. Reed would not care to take the English instrument and expect to be successful with it, for it needs so much attention on the part of the patient using it, as well as by the physician or skilled attendant, and yet it does do in the hands of the English what they say it will. If burns have happened, it must have been through inattention.

Dr. Reed has given over one hundred and twenty treatments without one blister, and that is saying a good deal for the American cylinder. It is readily controlled, and, if prop-

erly managed, can be used with perfect safety and satisfactory results.

Dr. Reed has had no cases but that were benefited, and he does not believe that there is any treatment so successful as hot air in curing cases of rheumatoid arthritis or gout. Massage is good, but it certainly does not reach obstinate chronic cases.

Dr. G. BERTON MASSEY called attention to a somewhat similar subject introduced by Dr. Kellogg, of Battle Creek, that is the incandescent electric-light bath. This consists of a large number of incandescent lamps, enclosed in a cabinet, which can be applied to individual portions of the body. Very good reports have been made by Dr. Kellogg and others as to the effects, which were attributed, not to the light, but to the heat. It was found that the temper-

ature of the body could be raised more quickly and more conveniently by this method than by heating the air, as by steam. Perspiration was induced more quickly with the electric light than in any other way. Dr. Massey thought that the same results produced by the cylinder described might be produced by electric heat, and probably in a more convenient way, for it would allow of application of the heat to any portion of the body. As it is thus possible to apply the heat to the trunk and abdominal centers it would fulfil the indications in lithemic cases better than Dr. Reed's apparatus. Dr. Kellogg refers the effect of this light-bath to radiant heat only; but since the discovery of the effects of the X rays it is possible that the tanning of the skin that results from this application may indicate an action of the light itself.

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## REPORT OF THE COMMITTEE ON THE HEALTH PROTECTIVE HOSPITAL FOR CONTAGIOUS DISEASES.

J. MADISON TAYLOR, M.D.

[Read May 12, 1897.]

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The Woman's Health Protective Association of Philadelphia was founded in 1893, at a time when the United States was threatened with an invasion of cholera, with an initial membership of two hundred. The Association decided that it was of the first importance to obtain a thorough knowledge of municipal government, and of the problems presented in pursuing their work for the public health, and for this reason they confined their attention to study for the first winter, and invited various public officials to address them, especially those of the Board of Health and the Department of Public Works.

During the second year of the Association's existence it was decided to form committees on the various causes affecting the public health and safety, with the aim of accomplishing some practical results, and the following committees were organized: Contagious Diseases, Water Supply, Street Cleaning and Collection of Garbage

and Ashes, Sweating System, Trolley and Literature. Later, the Street Cleaning and Collection of Garbage and Ashes Committees were consolidated, and also the committees on the Sweating System and Visiting Public Schools. To these have since been added Committees on Bakeshops, Playgrounds and Entertainment.

In the Contagious Diseases Committee much thought was given in 1895 to a slight epidemic of small-pox, and after some discussion, in a conference on the subject, the Association put itself on record in a strong resolution advocating vaccination, and also in resolutions praying the Board of Health to universally mark all houses containing the several contagious diseases. Considering the fact that the last epidemic of small-pox cost the city of Philadelphia twenty-one and a half million of dollars, it seems as if too strong action could not be taken by the Board of



Health to stamp out the contagious diseases. To the astonishment of the Association, however, it was discovered that the Board of Health finds great difficulty in causing individual cases to be flagged or marked. There is reason to feel that by agitation and education our citizens will soon come to see the misery that recklessness in this respect causes the community on account of the many outsiders who come to Philadelphia, as well as to our own citizens. It is a matter of first importance that people should not be allowed to walk unsuspectingly into a veritable death-trap. The Association has also taken active steps in regard to the contagiousness of tuberculosis.

Here it may be said that the Association at this time found itself much hampered by a lack of funds, and so it was decided to publish a Woman's Edition of the *Philadelphia Press*. This netted six thousand eight hundred dollars; forty-five hundred the share of the Health Protective Association, and twenty-three hundred to be the nucleus of a fund to start a Contagious Diseases Hospital for pay patients. A Joint Committee was formed of members of the Philadelphia County Medical Society and of the Woman's Health Protective Association, who issued a strong

appeal to the public, stating the necessity for such a hospital in Philadelphia. This Committee also protested against the removal of the Municipal Hospital from its present site.

During the past year the Street Cleaning Committee has been considered of use to the city by the Mayor and heads of departments, and hopes to increase its usefulness in the future.

The Committee has been actively engaged during the past year endeavoring to lessen in some way the habit of expectorating in public buildings, market houses and on the sidewalks. Permission has been given to place signs on the streets, with the words, "Please do not spit on the sidewalks," printed in plain letters. Believing that this habit arises from a lack of thought, the Association appeals to the public to kindly consider this suggestion. Efforts have been made to interest the Councils of the city in the matter, especially as a bill was brought up before that body forbidding expectoration in railway cars and in public buildings.

During a conference with the Committee on Fire and Health of Councils the question discussed was whether a law could be enacted against expectoration in public buildings or on the sidewalks.

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## THE MUNICIPAL HOSPITAL OF PHILADELPHIA.

EDWIN ROSENTHAL, M.D.

[Read May 12, 1897.]

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It must be confessed that many erroneous opinions have been formed regarding the value and the utility of the institution I wish to describe, and that many objectionable comments have from time to time been made by those who should be in a position to know better, in consequence of mere ignorance of the Hospital, of its situation, and of the work that is done; and it is this that prompts me to present this paper.

It might have been better for such a paper to have emanated from one of the physicians connected with the Hospital, or from a member of the Board of Health; but I trust it will not lose in value if one who has no connection with the institution or with the controlling body, details a short history of the events that led to the building of this Hospital, discusses its merits and defects; and whose knowledge of its workings has been obtained by ac-

cepting the courteous invitation to visit the Hospital, an invitation that is open to all physicians.

This paper claims no originality. The facts were obtained from the "Report of the Bureau of Health," substantiated by the various histories of Philadelphia; and also from the annual report of the physician in charge, Dr. Welch.

It is recorded that up to the year 1743, there had not been an organized Hospital in the city of Philadelphia. In 1726, small-pox broke out in the city, and a house located near the intersection of Ninth and South streets was used as an isolation house. The victims of this epidemic were taken to farm-houses. In the year 1743 a movement was started by the merchants of the city to provide for the sick, on account of the increase of small-pox brought by immigrants from Germany. The Colonial Assembly became alarmed and built a small hospital on State Island, at a later period called Fisher's Island, near the mouth of the Schuylkill river. This remained in use for sick immigrants until the year 1800, when the Lazaretto, on Little Tinicum Island in Delaware county, was organized.

The calamitous visitation in 1793 had so alarmed the inhabitants that it was considered absolutely necessary to institute measures to insure public safety. The Guardians of the Poor had already refused to receive small-pox or fever patients into the almshouse, then located on Spruce street, between Tenth and Eleventh. The Pennsylvania Hospital was closed at that time. The Guardians of the Poor took possession of the old circus at Sixth and Chestnut streets, but the residents of the neighborhood threatened to burn the place down unless the sick were removed. Application was then made to the Magistracy of the city, and finally a place was selected on Bush Hill.

The Board of Health was organized in 1794, and purchased Fish tavern, on the west side of the bridge, occupied for years by the Pennsylvania Railroad Company. This was used for a time for hospital purposes. The first hospital established by the city in 1796 or 1797 was at the foot

of Race street, on the Schuylkill river, and was known as the "Wigwam" Hospital. In 1805 the citizens in the vicinity of the "Wigwam" Hospital entered complaint against the institution. It was finally removed to a spot on the Wissahickon road, near where Ridge avenue and Wallace street now intersect each other. Here it remained for two seasons only, when the citizens demanded its removal. For a time the city was again without a hospital. The people seemed to be of the opinion that if another epidemic should visit the city, buildings should be located at some distant place to meet the emergency.

In the year 1810, a hospital for infectious diseases was erected on Bush Hill, where it remained until 1855, when it was removed. From that time until 1865 the city was without a hospital for infectious diseases, and this was a matter of much regret. The Board of Health was obliged to open the Lazaretto Hospital, and patients had to be removed twelve miles from the city. No one can form an adequate idea of the amount of suffering these unfortunates were subjected to.

In 1865 the "Municipal Hospital for Contagious Diseases," at Twenty-second and Lehigh Avenue, was completed, and handed over to the Board of Health. The plot of ground contains ten acres. Part of the plot is unavailable for hospital purposes on account of being located across the street. The buildings consist of a main structure containing a central administration building and two wings, having a total length of 280 feet and a width of 50 feet. Each wing contains two wards on either floor, 42 by 26½ feet, and 14 feet in height, making eight wards in all, each ward accommodating 20 beds. In the attic are six rooms on one side, and the same space on the other, though not divided into small compartments.

The main building is 50 feet square, with a basement, two stories and an attic, and is covered with a slate roof, French style. The center building has four rooms on each floor, 18 by 20 feet, with a hall 10 feet wide, containing a flight of stairs from the cellar to the attic, and a cross entry connecting with the piazzas that run

the entire length of the hospital wings. The wards in each wing of each story are separated by rooms 12 feet in width, provided with baths, water-closets, etc., and from them there is access to the piazzas, which were intended to shelter convalescent patients, and furnish them the means of exercise in the open air.

The wards are heated by furnaces in the cellar and also by open grates. The supply of water and gas is now obtained from the city mains. Formerly both had to be obtained on the premises. There is a stone stable and carriage house, and a laundry and drying-room under the same roof. These constituted the buildings in 1865.

The hospital, although a great improvement over any previously possessed by the city of Philadelphia, was incomplete in many respects and not well adapted for the treatment of a variety of contagious diseases. The plumbing was defective in plan and in execution. The drainage was conducted to wells upon the premises. In 1873 the drainage was very much improved by abandoning the wells and connecting the system with sewers near by. Water and gas were introduced from the city mains in the year 1890. In 1875 a chamber for disinfecting by dry heat, and one for disinfecting by chemic vapors were constructed at the north end of the laundry building. This was in use until the fall of 1893, when a steam disinfecting plant was constructed. In 1892 a cremating furnace was erected upon the grounds for the purpose of destroying infected clothing, bedding, etc., in a prompt and inoffensive manner. This furnace was constructed upon the plan of a reverberatory furnace, the smoke being consumed.

Another improvement, which is perhaps of greater importance, was the erection of a "Pavilion Hospital" in 1893. This building is located on the plot adjoining that upon which the main building stands, the plot having an area of about four acres. This building is complete in itself. It was erected with the idea that cholera would probably reach the city, and upon completion, was turned over immediately for the use of diphtheria patients. Since

the fall of 1893 it has been in constant use for the treatment of this disease. Frequently it has been filled to its utmost capacity, and as diphtheria is a disease that is constantly more or less prevalent in Philadelphia, and as the application of the bacteriologic proof will necessarily detain patients for a longer period than formerly, this building, which has an extreme capacity of sixty beds, has been found inadequate to meet the demands made upon it for this class of patients alone, and a new pavilion hospital was erected and completed in 1896. This addition will be spoken of further on.

In 1895 two bath-rooms were constructed in the place of the old disinfecting chamber at the north end of the laundry. These are complete in every respect and are used for bathing by a class of patients immediately after leaving the hospital building and before leaving the institution.

There have also been constructed this year three small portable hospital buildings, similar to the one erected in 1893 as a temporary small-pox hospital. These buildings are capable of accommodating twelve patients each, but one having been reserved for the nurse's use, the capacity is reduced to thirty-six patients. Connected with this group of buildings are two diet-kitchens, furnished with gas-stoves, two bath-rooms, and two water-closets, and a water-closet and bath-room for the nurses. A small laundry for their especial use has also been added. These buildings were to be used for small-pox patients, but are at present used for a special class of patients, such as mixed cases of scarlet fever and diphtheria.

In 1894 a lodge-house was constructed at the north-west entrance. A gate-keeper resides here, who answers questions asked by those who visit the hospital, in connection with relatives or friends therein. The information is transmitted through a telephone, communicating with the different parts of the hospital.

The most essential improvement has been made within the last three years, an addition being made last year to the diphtheria pavilion. This is similar in ap-

pearance to the other pavilions, but is vastly superior in construction, being provided with all the improvements that time and experience have shown to be necessary. Like the other pavilion, it is thoroughly ventilated, and heated by hot air, forced through the register. In this new pavilion have been placed three private rooms for pay-patients suffering from diphtheria only. Both pavilions are connected by a hall-way, which contains the main entrance; the resident-physician's room is also situated in the east end of the new pavilion, as is also the dining-room. Like the older pavilion, the new one is complete in itself, and is the most attractive building of the group. It is divided into two wards, the floors, walls, and ceiling being painted, and the capacity being 60 patients. Patients are brought to the hospital by two ambulances of modern design, one for cases of diphtheria, and one for cases of scarlet fever.

The institution can accommodate 356 patients, as follows:

The extreme capacity of the main building is.....	200 beds
The extreme capacity of the pavilions, sixty each, is.....	120 beds
The capacity of the portable hospital is.....	36 beds
Total.....	356

At the present time there is no small-pox in Philadelphia, but should a case occur the authorities would be in an embarrassing position, for all the buildings are now in use, as follows:

The main building for scarlet fever cases only; the pavilion hospitals for diphtheria cases only; the portable hospital for cases of scarlet fever suffering from diphtheria also.

The important fact should be recognized that the Municipal Hospital has permanently become the place of reception for the commonly prevailing contagious diseases, and will continue to be so with an increasing ratio of cases. This is the first merit, for, as physicians, we have the assurance that there is one place to which we can send our contagious cases, without regard to character, whether mild or severe, whether the patient will live or die. The Municipal Hospital will receive

all such cases without question; and will take care of them and treat them, in many respects, far better than they would ordinarily be treated at home.

The second merit of the Municipal Hospital is that it stands as a bulwark against contagious diseases. It prevents their spread by receiving the first cases, keeping them until the patients are well, and removing all danger of infection. In this way its benefit to the public can never be estimated. If due publicity were given to the cases admitted early, and spread of the disease thus prevented, the claims of this hospital on the municipal treasury would receive prompt consideration.

The third merit of the hospital is the conspicuous fact that the builders builded better than they knew, for, in placing the hospital at its present site, they chose the best locality for the good of the people. Centrally located, almost equi-distant from the farthest parts of the city, situated between two lines of railroad, so that residential improvements are totally out of the question, and in a taboored section of the city, the hospital has been an improvement to the neighborhood, and no just complaints have arisen warranting its removal.

Unfortunately, this hospital has also some demerits, and, while they cannot eclipse its good points, they are sufficiently important to call for some attention.

First: The old building should be improved. The piazzas, as suggested by Dr. Welch, should be enclosed with windows; they could then be used as sun parlors in winter, or as additional wards when the other wards become, as is frequently the case, overcrowded.

Second: No provision has been made for a home for the nurses. As is so generally known, disease spreads amid crowding, and a nurse might become the carrier of contagion. For this reason, among others, separate buildings should be constructed for each group of nurses. At present, such precaution is taken with the resident physician, but the means are inadequate to do so with the nurses.

Third: It is not the part of wisdom to group together the virulent and the mild cases of contagious disease. At present

cases of measles and whooping-cough are not sent to the Municipal Hospital, but go to the Philadelphia Hospital. It would be good policy to have a suitable hospital built at some distant point for small-pox cases, and to leave the Municipal Hospital for scarlet fever and diphtheria.

Fourth: The grounds are inadequate to meet the requirements of a modern hospital. The city should acquire possession of the surrounding land, which will always remain unsuitable for residential purposes by reason of the close proximity of the railroads. On this ground suitable buildings should be erected for the nurses, the physicians and the patients.

Especially for the patients there should be erected such buildings as could be used for the reception of suspected cases, and also buildings that could be used for those convalescing. No provision has ever been made for these two groups of cases, and the cost would be but the least important item.

At present there are no private rooms except in the diphtheria ward, and for diphtheria patients only. Provision should be made for those who can pay and are willing to pay. That the hospital lacks this has been one of the main factors that has prompted those interested in the public health to agitate for a pay hospital for contagious diseases.

## DISCUSSION.

Dr. J. MADISON TAYLOR called attention to two points that it is important to emphasize: One is, that after pretty careful thought on the part of a number of people, including the Board of Health, no place has been found better than the present site of the Municipal Hospital, both for the reasons given by Dr. Rosenthal so clearly, and for many other collateral considerations.

Secondly, the outfit and the place are small, the plant is inadequate in many particulars, and the older buildings are inferior in all ways. The original building should be disinfected by fire, as it is saturated with ancient infection. The opportunities for access to this locality are good and there are many points about this situation for the Hospital that make it desirable to retain it. The important question is, What is the best thing now to do when modern changes are contemplated? The present site is about the best place for the purpose. Another thing is that there is always enough of scarlet fever and diphtheria in our city all the time to warrant a hospital for these diseases alone, and this is a proper place for such cases. Small-pox had much better be in some remote place such as Tinicum Island, or if that is too remote then in a separate enclosure near the present one. Finally, there should be some adequately equipped place of isolation for the milder diseases that would work considerable havoc if they become severe, such as measles and whooping cough. That is a matter that will come up for immediate consideration in the future and will need considerable care.

Dr. BENJAMIN LEE presented the following communication:

Through the courtesy of a committee of the Board of Health of Philadelphia, and of Dr.

William M. Welch, Physician to the Municipal Hospital, I have recently had an opportunity of inspecting the new Diphtheria Pavilion and Administration Building of the Municipal Hospital, and I desire to bear cheerful testimony to the fact that in my opinion this building meets nearly every requirement known at the present day for a hospital for infectious diseases. The method of heating and ventilating by forcing pure, warm air into the wards at points high up in the walls and withdrawing it again by exhaustion at points near the floor, certainly leaves nothing to be desired in the matter of securing an ample supply of air at a proper temperature, without causing drafts upon the patients, its constant and ample renewal and its complete removal.

This is effected by means of a powerful steam fan in the cellar, and an electric fan at the terminus of the ducts in the upper story of the tower in which the plumbing appliances are placed; the fresh air being drawn through a lofty stack 50 feet distant from the building. It has been amply demonstrated that the thoroughly ventilated ward of a hospital affords a better opportunity for recovery than the sick room of the ordinary home, and especially of those of the poorer classes. It is a matter of observation that patients in the acute stage of small-pox, with high fever and delirium, after being a few hours in the purer air of a well-ventilated hospital, have experienced decided improvement, the pulse and temperature falling and the mind regaining its sanity. The painted and enamelled walls, rounded corners and impervious floors are admirably suited to prevent the retention of the germs of disease. The use of iron and glass in the furniture, wherever this is possible, is also an admirable precaution in the

same direction. The private rooms for pay-patients are extremely cheerful and attractive. I am sure that no one who has seen them would object to having his child, or other relative, removed to one of them, if circumstances were such as to make the treatment of the case in the home a danger to other members of the family and the community. It is evident that those who planned and constructed this pavilion were actuated simply by a desire to assure practical results in the treatment of the patients, and the prevention of the extension of the disease, and that not a penny was spent on unnecessary architectural decoration. I can heartily endorse the statement of the efficient Superintendent of the Bureau of City Property that "in this building the city has received a dollar's worth for every dollar spent." It has been my duty to inspect many such buildings, and I can honestly say that I have nowhere seen any better adapted for their purposes in every respect. I was especially pleased to note the care that had been taken to provide pleasant and comfortable quarters for the nurses and other attendants. Certainly if anyone is entitled to a comfortable sleeping room and a cheerfully furnished apartment in which her occasional hours of relaxation during the day may be passed, it is that devoted being, the nurse in an infectious disease hospital.

I desire to express my gratification at finding within the hospital enclosure a large pavilion appropriated exclusively to what are termed "mixed" cases; namely, of diphtheria and scarlet fever existing in one patient at the same time, inasmuch as in this way those who are so unfortunate as to have received both infections into their systems are afforded a refuge. Otherwise, in the interests of those suffering from either disease alone, it would have been essential to exclude them. There is, however, still another class of patients of this description for which, owing to lack of funds, provision has not been made. These are the cases of mixed measles and diphtheria. It is sincerely hoped that City Councils will appreciate the necessity for a provision for this infection and will at the earliest possible moment provide a sufficient fund to erect a separate and distinct pavilion for such cases.

In this connection I beg to be allowed to remark that the State Board of Health has been so impressed with the mortality resulting from measles, which has commonly been considered so mild a disease as to be almost excluded from the necessity for legal restrictions, that it has just issued a circular for the object of impressing both on health-authorities and on the popular mind the importance of subjecting this disease to precisely the same restrictions as are now in force for the other contagious diseases.

Taking the entire group of buildings I doubt if any city in this country has a more complete and well-arranged hospital for the treatment of communicable diseases. This being the case, what necessity exists for the establishment of private pay-hospitals for the treatment of such

affections? It is not probable that any hospital erected by private subscription will be more perfect in all its appointments or will afford more cheerful accommodations, even for those who have been accustomed to luxurious homes, than are found in the private rooms of this new pavilion. The necessity arises from two well-established facts:

First, that even with the new pavilion there is little more room provided than at the present time is required for the care of the city's wards, while the very limited number of pay-rooms would make it necessary to place the greater number of pay-patients, applying for admission, in the general wards; and secondly, that there exists in the minds of the community so deep-rooted an objection to making use of the charity hospital of the city as a refuge for the members of one's own family that the public never could be induced to make use of it to such an extent as would meet the objects which are in the minds of those who are favoring the establishment of such private hospitals.

Nothing is more remarkable in the relations of the public to the medical profession at the present time than the readiness that has developed within a comparatively brief number of years to avail themselves of the immense advantages afforded by hospital treatment, especially in the case of the surgical affections. It must have been observed, however, that the line is drawn with tolerable sharpness between private hospitals, pay hospitals, and almshouse or charity hospitals. This arises partly from a natural and praiseworthy spirit of independence, which makes people dislike to have it known that their friends are in an institution which is supported out of the city's funds; and secondly, from the dread of contact with those belonging to a lower social class and who may be supposed to be of uncleanly habits.

I do not conceive that any amount of argument is going to uproot this deeply implanted horror of eleemosynary institutions. The only other solution of this problem, therefore, lies in the establishment of a number of comparatively small hospitals for the treatment of contagious diseases in different sections of the city, so that they may be easily accessible, especially adapted in every way for the treatment of such diseases in accordance with modern requirements, and with such careful provision for the purification by fire of all air which has once entered the buildings that the possibility of the transmission of disease beyond their walls shall be absolutely prevented.

I entertain no doubt that in a comparatively short time the public would begin to appreciate the opportunities thus afforded and to avail themselves of them. The advantages accruing would be:

First, a great diminution in the number of centers of infection.

Secondly, a great diminution in the period of domiciliary quarantine always so full of annoyance, vexation and loss.

Thirdly, the ensuring of the best possible conditions, both hygienic and therapeutic, for the recovery of the patient.

Fourthly, the great diminution of risk to other members of the household.

It is not necessary for this purpose to erect very large buildings and it would be folly to indulge in any excess of architectural display. The experience of the Board of Health of this city, as well as of those of other cities, amply demonstrates that such a system of hospitals as is contemplated could be constructed at no very great expense and it is presumed that once established and appreciated, they would support themselves and possibly prove paying investments.

In conclusion, I desire to offer the tribute of my admiration, however unworthy, for the devoted manner in which the present Physician of the Municipal Hospital has for so long a period discharged the responsible duties of the position.

Dr. Wm. M. WELCH said that many difficulties are encountered in the Municipal Hospital, the chief of which is the difficulty of obtaining money sufficient to provide what is required. A number of pavilions were recently erected, and they are in many respects very complete and satisfactory. The diphtheria pavilion, erected in 1893 and enlarged in 1896, is certainly well adapted for its purpose. It is indeed so complete in all its appointments that there is but little to ask for in the way of improvement.

The Main Hospital building, erected in 1865, has had nothing added to it since, and is very much in need of repair. It should be enlarged, modernized, and perfected. In some respects the wards are excellent: they are large, the ceilings high, the corners rounded, and they contain large open fire-places, but they are not properly heated and ventilated. The bath-rooms and water-closets are inadequate and unsanitary. There are no rooms for pay-patients and no extra diet-kitchens. The only place available for preparing food for distribution is in the bath-rooms, and these are in the same apartments with the water-closets. The rooms for nurses and other employees are not sufficient, and most of these rooms cannot be heated because of the absence of chimney-flues. The needs of the hospital have frequently been pointed out, but it has never been possible to convince City Councils of their absolute necessity.

A recent census of the hospitals in this city shows that the Municipal Hospital occupies a place second only to the Philadelphia Hospital as to the number of patients under treatment. At the present time there are 312 patients in the various buildings; the daily average during the winter having been about 300. In order to accommodate this large number it is necessary to place two children in one bed in many cases, one in either end. This sounds worse, however, than it really is, for the beds are large and the children small. This condition of things should, however, not exist, and it would not if sufficient

money were appropriated to provide what is needed.

The diseases in the hospital at the present time are scarlet fever and diphtheria. There are a number of mixed cases under treatment; that is to say, cases in which scarlatina and diphtheria co-exist. These are isolated and treated in a building known as the temporary hospital. Not infrequently the Loeffler bacilli are found in the fauces of well-marked cases of scarlet fever; and, on the other hand, the scarlatinal rash frequently occurs in well-marked cases of diphtheria. In the latter event the source of the scarlatinal affection is sometimes known, while at other times it cannot be ascertained. It not infrequently happens that the diphtheria-ambulance is sent for a case reported as one of diphtheria, but when the case is examined by the resident physician who accompanies the ambulance it is found to be one of scarlatina. This ambulance then returns to the hospital, and the scarlet-fever ambulance is sent for the patient. In spite, however, of all the care that can be exercised an atypical case of scarlatina occasionally finds its way into the diphtheria-wards, and the infection spreads. Dr. Welch's experience leads him to believe that there is a very close relation between these two diseases. Often both of them are seen in the hospital at the same time, equally well marked in different members of the same family. These facts show how important it is that the hospital should be provided with ample facilities for separating not only the various infectious diseases, but also every possible form of co-existence of these diseases.

The hospital grounds should be enlarged. This can readily be done by purchasing the adjoining plot of ground to the south of the hospital. The acquisition of this land is necessary in order to provide a place for the erection of a small-pox pavilion. If small-pox should occur at the present time it would be necessary to put the cases in a tent; and there is even no place where a tent could be located so as not to endanger the scarlatina and diphtheria patients now under treatment. The vast majority of patients suffering from the latter diseases are children, and many of them unprotected by vaccination. Hence, there would be great risk of the variolous infection spreading.

It is injudicious to treat small-pox patients in the same locality as patients suffering from other diseases, even though the various pavilions may be separated a reasonable distance from each other. There would be but little risk so long as the number of small-pox cases was small, but when the cases are numerous, it is necessary to employ a large number of nurses and other attendants, some one of whom at an unguarded moment, as may be safely assumed, will grow careless, even under the best management, and thus become the agent of spreading the infection. Dr. Welch is becoming more and more convinced every year that some other suburban section should be selected for a small-

pox pavilion, and that the present buildings should remain indefinitely where they are for the treatment of diphtheria and scarlet-fever patients. This change would probably remove all opposition to the present location of the hospital.

DR. JAS. TYSON asked the question whether an ideal plant would involve a separate room for each case of infectious disease of this kind, or whether all could be treated in a common ward to as great advantage.

DR. WELCH replied that the risk of inter-communication of disease could in that way be prevented; but such a method would be quite impracticable in a large hospital.

DR. ROSENTHAL said that the only way to open the eyes of Councils to the necessity of extension and alteration of the Municipal Hospital is through experience, such as an epidemic of small-pox, or some other infectious disease. The failure of Councils to act in the matter has caused the Health Protective Association to undertake to secure the means to build a paphospital for contagious diseases. The diphtheria pavilion of the Municipal Hospital is in every way a most admirable place, and if there were a sufficient number of such buildings for cases of scarlet fever and diphtheria the projected new hospital would scarcely be necessary. The present situation of the Municipal Hospital can hardly be improved upon.

## PORTABLE DOOR-ATTACHMENT FOR APPLYING SUSPENSION.

H. AUGUSTUS WILSON, M.D.

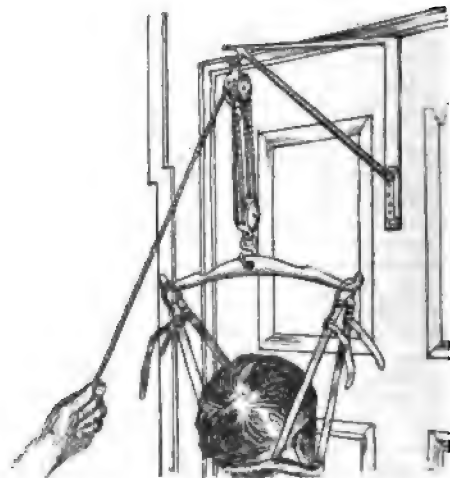
[Read May 12, 1897.]

The great advantages to be derived from suspension in the many cases susceptible to its use are seriously neutralized by the inconveniences of the apparatus heretofore employed. The value of suspension in the diagnosis of spinal lesions has long been recognized, and its use as a therapeutic measure would be more frequently resorted to at the residences of patients but for the difficulties referred to.

The arrangement that I suggest, which is an adaptation of the painters' "jack," is intended to overcome the disadvantages of the cumbersome tripod, and the various fixtures that are screwed into the walls, ceiling or woodwork. Its use does not tend to terrify the patient by its gruesome appearance, nor does it leave defaced paint or plaster as reminders of the ordeal. The simple construction of the bracket renders easy its attachment to any convenient door, and its speedy removal leaves no trace of its use.

In the first illustration the bracket is shown in use, with the door closed, so as to avoid drafts upon the patient, while the second illustration shows its use with

the door standing open. In the latter method a wedge of some sort should be placed under the door to prevent too great

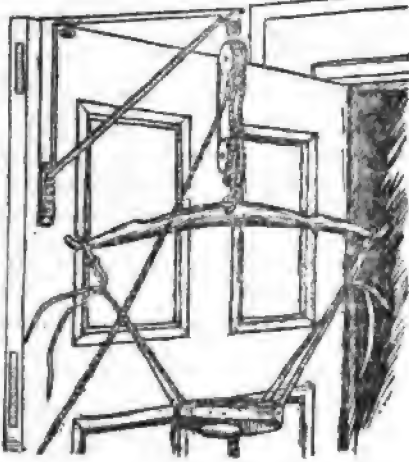


strain upon the hinges. The thin steel used permits the horizontal bar to occupy the space that usually exists between the top of the door and the jam, and yet the device is sufficiently strong to sustain a weight of two hundred and fifty pounds.



It is adjustable to doors varying from one to three inches in thickness, and even a thin closet-door can be used to suspend a child.

It will be perceived that to the bracket may be attached any desired form of sus-



pension and extension apparatus, such as axillary supporting bands, in addition to the head-rests shown; or the suspension-

extension apparatus recommended by Dr. S. Weir Mitchell may be as conveniently employed. The applicability of the apparatus to medical and other gymnastic work will be apparent, and further uses will readily manifest themselves as the requirements are presented.

When graduated and exact extension is demanded an ordinary spring weighing-machine can be interposed between the hook on the bracket and the suspension-apparatus proper. This method has been satisfactorily employed by having the patient seated in a chair, with the back to the door upon which the bracket was attached; extension to the desired number of pounds being obtained, the rope made fast and the definite length of time of suspension-extension noted by a watch.

The entire outfit, as shown in the cuts, consisting of bracket, rope, pulleys and head-support, weighs only eight pounds, and when taken apart will occupy but little space in a physician's bag. I desire to acknowledge my appreciation of the faithful execution of my designs by Mr. A. Gustaf Gefvert, mechanician to the Jefferson Medical College Hospital, from whom the apparatus may be obtained.

## DISCUSSION.

DR. J. MADISON TAYLOR said that the application of this clever little device is of much wider scope than being of use to the orthopedic surgeon. The physician who has to do with cases of diseases of the nervous system constantly needs some means for suspension. A simple apparatus of this sort, for suspension, is oftentimes of very great advantage. Dr. Weir Mitchell has used suspension in many sorts of spinal-cord difficulties, especially when there has been trauma, and oftentimes with marked success in quite unexpected directions. The degree of suspension is readily regulated by

means of the clock-face weighing scales. One word as to suspension and extension in locomotor ataxia, which has come up on the wave of popularity and gone down again, rather unjustly, too—there were certain things gained that made it well worthy of trial. The apparatus in use at the time of greatest popularity seven or eight years ago was limited to locomotor ataxia.

Dr. Taylor has noted relief of transverse myelitis and a number of cases of that sort from suspension, and is strongly inclined to use it more persistently in future.

SOME OBSERVATIONS UPON THE AORTA WITH REFERENCE TO ITS  
SPECIAL FUNCTION AS A FACTOR IN THE NUTRITION OF  
THE MYOCARDIUM, WITH SUGGESTIONS AS TO  
TREATMENT.

HENRY BEATES, JR., M.D

[Read May 26, 1897.]

The contributions to the literature of the lesion designated "segmentation and fragmentation of the myocardium," while definitely demonstrating the retro-grade changes that have taken place in the cardiac muscle-cell, are conspicuous for the absence of an attributable cause. It was this fact, as brought forth in the presentation of a classic paper, read before the Pathological Society of Philadelphia quite recently by Prof. Hektoen, that determined me to submit the results of some observations bearing upon the subject and covering a period of several years.

Before submitting the conclusions reached, attention is directed to the peculiarity of the histologic structure of the aorta, which seems to demonstrate anatomically the special quality possessed by this vessel, and almost rendering practicable the claim that it is in reality an especial organ. This quality is *elasticity*. Study of such an artery as the common iliac or femoral, when compared with the vessel under consideration, discloses a marked contrast in the intima and media; that of the aorta possesses no internal elastic lamina, but a layer of fibrous connective tissue immediately under the several layers of endothelial cells. In either of the former vessels, there is a thin sub-endothelial elastic lamina. The media of the smaller arteries is largely muscular, while that of the aorta is conspicuous for its large proportion of elastic plates and comparative want of muscular element. The propulsion of the blood through the aorta then, is, in addition to the impulse and rate imparted by the heart, supplemented and augmented by this special aortic property of elasticity. Here let us recall the fact that the coronary arteries of the heart are terminal. To make this feature plain, permit the exaggeration of

a fact and statement, that each ultimate twig of distribution terminates in an area composed of one or several myocardial cells, and, as it does not anastomose, it is the sole source of supply of nutriment for that especial region. The cardiac cell, again, does not receive its pabulum directly from a supply of arterial blood, but like the cells of the cornea, from an intercellular nutrient fluid, from which each cell, by either imbibition or special metabolic function, appropriates the pabulum necessary for its life. These nutrient lacunæ and lymph-channels depend entirely for their supply and renewal of nutrient material upon the *normality* of intracardiac circulation and muscular action. Physiologic research has definitely proved that each cardiac beat is almost entirely dependent upon the complete filling or normal tension of the coronary arteries preceding that particular contraction, and just here is the importance of the aortic elasticity especially to be observed, for upon the force of the recoil of the column of blood in the aorta depends the complete filling of, and therefore normal condition in, the cardiac viscus. Excluding the several diseases, syphilis, arterio-capillary fibrosis, endarteritis, etc., these observations are limited alone to those aortic changes that occur independently of the *materies morbi*, whatever it may be, operative in these affections, and that, so far as known, can only be ascribed to faulty nutrition, and are usually associated with senility. These occur much earlier in life than is usually recognized.

Of course there are acute cases in which similar results are induced through the same channels, as in fever, but of these nothing at this time will be said.

The point desired to be made is, that *diminution of the elasticity of the aorta*,

for reasons now obvious, results in diminution of the normality of cardiac contraction, and, as a consequence we have those nutritional degenerative changes characterized by cloudy swelling of the myocardium. This is insular or of varying extent, as the degree of subtraction from the normal coronary fulness obtains.

This condition can be recognized clinically and the symptomatology centers around the phenomena of diminished cardiac function. Preternatural rapidity of the pulse-rate and variability of force, as indicated by diminished resistance, are constant phenomena. Dyspnea, varying with the extent of development of the affection, is experienced upon trivial exertion; and the inconveniences of the commonly associated loss of vaso-motor tonus, and the evils of the resultant passive hyperemia, such as digestive disturbances and even impairment of intellect, complete the clinical picture.

Physical examination discloses distant cardiac sounds, with augmentation of the second, and also irregular or repudiated contraction. Arrhythmia is now and again but transiently detected, *i. e.*, while

examining the patient there may occur for several successive cycles double systolic action, as though one-half of a ventricle contracted and was rapidly followed by the other, or the right and left acted separately, one immediately after the other.

The treatment consists in the exhibition in full doses and extending over long periods of time, *i. e.*, months and years, of the pure German digitalin of Merck.

After continuing this for months and years, practically uninterrupted, the nutritional deficiencies not infrequently so improve that the otherwise disabled sufferer is restored to comfort and usefulness. This assertion is based upon fifteen years of observation, during which the facts brought forth have been verified, and many sufferers, years ago becoming disabled from the distresses of failing circulatory power, are to-day, under the proper use of this remedy, leading comfortable and comparatively useful lives.

The dose of this especial derivative of digitalis ranges from gr. 1-10 to gr. ss, given from three to six times daily, according to indications.

## DISCUSSION.

DR. H. A. HARE said that it is to be remembered that myocardial degeneration is generally regarded by therapeutists as a condition in which digitalis is contraindicated. In addition to valvular lesions of the heart with high arterial tension, therapeutists in general believe that fatty degeneration, or other degenerative change, contraindicates the use of this remedy, and that in direct proportion to the degenerative change which is taking place in the myocardium digitalis does less and less good when it is administered.

The question in regard to the filling of the coronary arteries is one that has long interested therapeutists and physiologists, one school asserting that these vessels are filled only during diastole, while another school asserted that they are filled during the systole of the heart. From a therapeutic standpoint it probably makes very little difference which one of these theories is received as correct, because the coronary arteries after being filled do not instantly supply the cardiac tissues with blood. Those who have watched the cardiac muscle in the lower animals know that when active and forcible systole takes place the heart-muscle becomes very much paler, and apparently is more bloodless than when it

is in wide diastole, and this, of course, is a condition that takes place in any muscle which is actively contracted. From the studies that he has made (which, however, are not sufficiently accurate to be put on record), Dr. Hare believes that the cardiac arteries are supplied during the systole of the heart, just as are all the other arteries of the body, and that this particular impact of blood, which does not benefit the cardiac muscle until the next diastole, comes when the interchange of gases and the nutritious substances of the blood and the tissues of the heart takes place.

It is to be remembered that there are other influences at work in the heart, governing the muscle, besides the mere blood supply from the coronary arteries, as, for example, the influence exercised by the pneumogastric nerve.

Ten or twelve years ago Gaskell, of Cambridge, sought to prove that the pneumogastric nerve is the trophic nerve of the heart, that as a direct result of the action of the pneumogastric fibers the heart-muscle receives nutritional impulses in the same way that all muscles do. He reached his conclusions largely from studies in comparative anatomy, and basing his ideas upon evolution, without being able to prove that this

was the direct effect of the pneumogastric nerve in the lower animals. It has been the teaching of a number of therapeutists since Gaskell's studies that digitalis does good in cardiac disease not only through stimulating the heart by increasing its blood-supply, by filling more successfully the coronary arteries, but at the same time it effects another trophic and nutritional influence by stimulation of the pneumogastric nerve both centrally and peripherally.

Dr. Hare referred to some experiments which have yet to be supplemented by a pathologic report. This research was based upon the clinical fact that nearly always when a patient has had marked valvular disease of the heart and takes digitalis for a number of weeks and then dies from any cause, dilatation and hypertrophy of the heart are found. Further, in patients who die after taking digitalis for many weeks because they have a cardiac lesion, marked cardiac hypertrophy is found. The ordinary clinician would imagine that the cardiac hypertrophy is due rather to the attempt of the heart to compensate for the leak than to the digitalis. A number of studies have been placed on record in which digitalis has been given to animals and to man, and blood-pressure and pulse-rate have been noted, but there have been none to show what the influence of digitalis is on the heart when taken for many days. Dr. Hare resorted to the somewhat homely method of taking ten pigs all belonging to the same litter (choosing pigs because they are more easily dealt with than dogs, which are liable to break loose, and because pigs also have a diet more like that of human beings), weighing them, dividing them up into two batches of five each, so that the weight of the five pigs in one pen was within one and a half pounds of the pigs in the other pen at the start. Five of the animals then received ascending doses of fluid extract of digitalis from January 4 to May 1. After they had taken the drug for three or four weeks the farmer in charge expressed certainty that the pigs that were getting the medicine were growing faster than the pigs that were not. On May 1 the animals were found to have gained twenty-eight pounds more than those without digitalis, and the hearts weighed nearly five ounces more than those of the pigs that had not gotten digitalis. Of course, it may be said that the increase in weight was due to the stimulation of the heart, which then grew faster, or that the drug stimulated the growth of the pig and the heart grew in proportion. Be this as it may, the results are very interesting, and especially if histologic changes are found. In an imperfect series of studies on puppies made several years ago in conjunction with Dr. Meigs, histologic examination of the hearts rendered it probable that the fibrils were stronger.

Finally, in regard to the cumulative ac-

tion of digitalis, the medical profession in the United States does not generally recognize a rule that is almost invariably followed by French therapeutists, namely, that digitalis is a remedy that should not be given for a long period of time continuously. The best French therapeutists give digitalis for seven or eight days; then stop from three to eight days, because the effect is so prolonged that its good influence will be extended over from three to eight days, and the body has a chance to get rid, by oxidation or elimination, of the poison that has been accumulating in it more rapidly than the physician imagines. Dr. Hare believes that digitalis is given far too freely and frequently, in the sense of too often in the twenty-four hours. If ten or fifteen drops of the tincture be given twice a day, night and morning, until the full physiologic influence of the drug is exerted, or, if the case be pressing, with marked symptoms of cardiac distress, three or four times a day until the distress has been relieved and the heart put in good condition, then in exactly the same way the dose of digitalis is cut down, as one would in treating a syphilitic with mercurous iodid, until small doses of digitalis are being given and its influence continued. When a patient has syphilis he is at first given doses of mercury so large as to almost salivate him and then tonic doses are continued for an indefinite time in the same way.

Digitalis is to be given until the full effect is secured, so as to relieve the patient of pressing symptoms, and then the effect is maintained by cutting down the drug until so-called tonic doses are administered.

There is scarcely any subject in medicine or therapeutics about which more difference of opinion or more uncertainty exists than as to what is meant by the term "cumulative." By cumulative action Dr. Hare understands the development of more or less severe symptoms of digitalis poisoning, after the administration of the drug for some time.

It is probable that digitalis does not differ from arsenic or strychnin in its ability to produce a cumulative action, except that its effect is exceedingly prolonged and it is exceedingly slowly eliminated or burned up in the body; whereas if a man be given strychnin in very full doses he will develop symptoms of poisoning; in a very few hours more the drug will be rapidly eliminated from his body and he will be entirely free from it. In the use of digitalis this effect comes on with extraordinary suddenness, without any warning in many cases, and often when the patient makes some movement. Brunton reports cases in which patients have gone on taking digitalis, developing the slow, full pulse, and getting up to urinate or sitting up suddenly in bed, when the balance of circulation is upset and instantly the heart beats in the most tumultuous manner, and syncope comes on, sometimes with collapse and death. Janeway also

confident of these effects that he states the belief that he has made frequent post-mortem examinations in Bellevue Hospital, New York, in cases of patients taking digitalis who had gotten up to go to the water-closet adjoining the ward and dropped dead. The cause of death was supposed to be a lesion of the heart, when in reality it was due to the action of digitalis. It is probable that this very effect is produced through incoordination of the action of the heart-muscle.

DR. ALFRED STENGEL, speaking from the clinical and pathologic points of view, feared that Dr. Beates was playing rather fast and loose with the term fragmentation of the myocardium. This condition, which was described a great many years ago by Zenker, in a paper in which he detailed the changes in tissues as the result of typhoid and other long-continued fevers, and subsequently by two Frenchmen, is a distinct pathologic lesion. Fragmentation or segmentation of the myocardium, or both, is a change that, so far as pathologists know, is certain to result in a fatal termination. Therefore to speak of segmentation of the myocardium being recovered from under the influence of digitalis is, from a pathologic standpoint, to speak without sufficient authority. Cloudy swelling of the heart, on the other hand, is recovered from every day. Every time a patient has typhoid fever, and the fever continues at its usual elevation, there is cloudy swelling that is recovered from; and probably in advancing age, with disease of the coronary arteries or of the aorta, there is cloudy swelling which may be recovered from, with or without the administration of digitalis.

Fragmentation and segmentation of the myocardium probably represent a condition that occurs only just before death or post mortem. According to Zenker it is a post-mortem or an agonal condition.

There is no evidence in support of the possibility of segmentation and fragmentation being recovered from. It may be that it is, but there is no evidence in the lesions themselves that there is any reparative process; there is no exudation of white corpuscles. Therefore, pathologically there is no evidence that myocardial fragmentation ever gets well or ever has any tendency to get well, and therefore the opinion of pathologists that it is a condition developed at the close of life, just before death or that it appears after death, is more or less justified.

As to the local effect of the blood-supply in producing this change, it may be said that all experimental evidence tends to show that the condition is due to toxic causes, to circulating poisons, probably to fever in certain cases, and leading to that sudden rupture of the fibers of the heart-muscle which terminates life or leads to death. The mere shutting off of some of the coronary circulation may develop serious changes in the heart-muscle, but that fragmentation and segmentation are among such changes is not probable.

DR. S. SOLIS-COHEN said that Dr. Stengel has called attention to an important question which goes still further than this discussion, and which it is perhaps worth while to lay additional stress upon. Concerning the possibility or impossibility of recovery from or recognition during life of certain lesions demonstrated post mortem there is always room for debate. From a merely logical standpoint much that has been said as to segmentation and fragmentation might be said as to cloudy swelling. Aside from that, the absence of reactive changes in connection with fragmentation and segmentation seems conclusive, at least for the present, against any use of these terms which would connect them with lesions occurring in the course of life except at its termination. Disease and recovery represent always one continuous process. Unless such continuity can be traced between the action of disease-producing substances or forces, the lesions set up by them, and the processes or reactions of recovery, there is not established a chain of morbid events from which recovery is possible. The fundamental difference between recovery in the usual course from certain lesions and death immediately following other lesions is simply that in the latter there is no train of action set up at which the other end there may be a return to normal processes. The pouring out of callus following fracture is one of the very simple illustrations that will immediately be called up to illustrate what is meant.

The disease and the recovery, the loss of structural integrity and its restoration, are connected in an indissoluble cycle. Hence, if it be found as to fragmentation and segmentation, or as to any other lesion, that in all the cases studied up to date there is no evidence of a reactive process or one that would naturally lead to restoration of normal integrity, there is no justification for speaking of that as a lesion from which recovery does take place, as a lesion that is amenable to therapeutic measures.

A word in relation to the therapeutic administration of digitalis: It was not to have been expected that patients could take digitalis for three years uninterruptedly, and if patients can do that there is another fact to add to the data upon which therapeutic theories must be based. A good practical method of interrupting the administration of digitalis without interrupting the continuous action of some cardiac medicament has proved feasible and successful. The action of strophanthus in some respects closely resembles the action of digitalis, and may be used at times to replace it. It is quite possible to give digitalis and suddenly stop, and then give the patient strophanthus and suddenly stop, and then give again digitalis and so alternate; but in many instances of cardiac affections in which the wise administration of some such drug seems to be necessary, it is better to adopt a method of gradual alternation. For instance, ten-drop doses of the tincture of digi-

talis twice a day or three times a day can be continued for a week. Then one drop less is given at a dose, substituting in place of the drop of tincture of digitalis a drop of tincture of strophanthus, and continuing this process for ten days. Then the patient will be taking ten drops of strophanthus, which dose is continued for another week. Then reversing the process the patient is gradually brought back to the full dose of digitalis, and so on.

A point that deserves to be further enlarged upon is the great importance of the vasomotor tone in the treatment of cardiac and vascular diseases, and in the improvement of nutrition generally. In most cases of circulatory disorders too much attention is paid to the condition of the cardiac valves or perhaps the condition of the cardiac muscle, and too little attention to the condition of the terminal vessels. In some cases the action of digitalis in increasing blood-pressure by heightening the tension of the vessels is undesirable. This operates against the relief of the valvular lesion for which the drug is given, and must be modified by nitro-glycerin or otherwise. In some cases, however, the only medicament that is necessary is one that will raise blood-pressure by constricting the vessels if need be, or, on the other hand, lower blood-pressure by relaxing the vessels. It would be wandering from the subject to cite the drugs or other measures which can accomplish this or that action, but in many cases, and chiefly in just such cases as those described by Dr. Beates, that is from the clinical standpoint, the best results follow the use of baths or gymnastics, or medicaments the object of which is to heighten the nutrition of the nervous centers generally and to improve the tone of the vessels especially.

DR. HENRY BEATES said that from the discussion it was evident that the impression prevails that he believes recovery from segmentation and fragmentation of the myocardium possible. This is not the case, as the lesion is necessarily a fatal one, and may or may not be associated with the act of death. It is to be looked upon as the ultimate consequence of the degenerative process characterized by cloudy swelling, dependent upon diminished supply of pabulum to the myocardium, and under the conditions to which the remarks submitted

were limited. Of course, any condition diminishing the volume of blood in the coronary arteries, whether from obstruction *in loco*, or from diminished aortic elasticity, or reduced vaso-motor tone, will practically bring about the same nutritional changes and calls for the application of the principle underlying treatment, viz., the restoration of circulatory equilibrium, and this the remedy named does. Reference has been made to the powerful effect of digitalis upon the ventricular muscle, and that if used in sufficient quantities the systolic contraction is so intense as to squeeze out all of the blood. If this is adduced to combat the theory advanced, it is to be recalled that administration of digitalis is followed by augmentation of the force and rate of flow of the column of blood through the aorta, with the consequent compensation for the loss of elasticity; the period of diastole is prolonged and better opportunity is afforded for the relaxed muscle to be thoroughly surcharged with blood, and the nutritional processes to be successfully operative. Hence the apparent objection falls.

As to the absence of evidences of reactive inflammation discoverable in segmentation and fragmentation, it is to be remarked that that feature only reinforces the position taken, and proves that the condition described is pre-eminently one of impaired nutrition, and that its proper treatment consists in the exhibition of the remedy known to possess the power of restoring, other things being equal, those conditions upon which healthful nutritive activity depends. That other influences are concerned in the nutrition of the heart is a certainty, and the trophic function of the pneumogastric doubtless plays a conspicuous role, and when the action of digitalis upon this nerve is recalled, the inference is fair that in its stimulation of pneumogastric power the trophic action shares in an equal degree. Dr. Hare's guinea-pig experiment is especially interesting, and still further demonstrates the value of digitalis as a stimulant of cellular metabolism. It is probable that when the histologic studies are completed in those animals in which growth and development were so pronounced, it will be shown that the power of digitalis to augment cell action and nutrition will be incontrovertibly proved—a still further support for the position advocated for the treatment of impaired cardiac nutrition.

## MONSTERS.

THEOPHILUS PARVIN, M.D.

[Read May 26, 1897.]

*Monstrum* in Latin has its corresponding word in Greek *τερας*, and from the latter we have *teratology*, or the science of monstrosities. But each of these primary words, *monstrum* and *τερας*, points, however, to a supernatural origin. Aristotle called monsters errors of nature; Pliny spoke of them as plays of nature, marvels for us, of which the popular expression freaks of nature, seems but an echo. Paré, in the sixteenth century, defined them as "things which appear against the course of nature, and are most frequently the sign of some coming evil."

A few illustrations from history show the common belief in monstrosities being ominous. Tacitus states that in the course of the 49th year B. C., the public mind was occupied with accounts of prodigies which seemed the harbingers of impending calamities. Among these, "In the streets and roads were found exposed several monstrous births with double heads, some of the human species, some of brutes; or were discovered in sacrifices at which custom required beasts that are pregnant." Tacitus said further, that the death of Claudius was heralded by the birth of double monsters. Livy, Y. R. 545, asserts that an infant was born at Frusino, as large as a child four years old, "and not so much an object of wonder from its size as that it was born without any certain mark of distinction whether it was male or female, which was the case two years before at Sinuessæ. Aruspices, called in from Etruria, declared this indeed to be a foul and ill-omened prodigy, which ought to be removed out of the Roman territory, and, being kept far from coming in contact with the earth, to be plunged into the deep. They shut it up alive in a chest and, carrying it away, threw it into the sea."

According to Herodotus, Xerxes was warned against the invasion of Greece by a prodigy which he could have easily interpreted, a mare giving birth to a hare,

for with the swiftness of a hare he would be compelled to return.

Passing a long interval we come to the time of Luther, and he still held the old notion that a monstrosity was ominous, for the birth of a monstrous calf, he asserted, pointed to some important impending event, and he hoped it might be the last day. At about the same time Montaigne, though not reaching the truth, wrote more wisely than the Protestant Reformer, for, after describing "a monstrous child," he said, "Those that we call monsters are not so to God, who sees in the immensity of His work the infinite forms that he has comprehended therein; and it is to be believed that the figure which astonishes us has relation to some other figure of the same kind unknown to man. From his all-wisdom nothing but good, common and regular proceeds, but we do not discern the disposition and relation."

That sexual relations between different species of animals resulted in monstrosities was for many centuries a common belief. Dr. Ogle† has said: "That the ostrich is a kind of link, uniting birds and mammals, is not a fancy confined to Aristotle. The vulgar opinion in Arabia still makes it the product of a camel and a bird, as in the days when it got the name, already used for it by Pliny, of *Struthio-camelus*." Jeremy Taylor had this faith: "For so the wild foragers of Libya, being spent with heat, and dissolved with the too fond kisses of the sun, do melt with their common fires, and die with faintness, and descend with motions slow and unable to the little brook that descends from heaven in the wilderness, and when they drink they return into the vigor of a new life, and contract strange marriages; and the lioness is courted by a panther, and she listens to his love, and conceives a monster that all men call unnatural,

† Aristotle on the Parts of Animals. Translated, with Introduction and Notes. By W. OGLE, M.D., etc.

and the daughter of an equivocal passion and a sudden refreshment." Nay, credulity was so great that it was believed some human beings were begotten in bestial relations. Thus Attila was by some declared to have been begotten by a dog. Can we doubt that when Attila brought his immense army to Italy, Romans said

In the vegetal world deviations from the normal are in many instances so great that they are monstrosities. Some of these are apparently useless, as when a second cone is formed, not at the end of a pine-tree branch, but at the middle. Double flowers also are monstrosities. Such instances are numerous, and beauty



*Cur?* There was a Danish† king, his body being so thickly covered with hair, that a bear was thought to have been his father.

† We know not whether this hairy Dane illustrated the truth of the Latin proverb, *Pilosus aut fortis, aut libidinosus* Mademoiselle de Lenclos, that wonderfully gifted and beautiful Aepasia of the 16th century—Mademoiselle was almost the only woman whom Queen Christina of Sweden called upon when she visited Paris—knew the Latin proverb, and, exclaimed one day when in the arms of her lover: "*Ah onseigneur il faut que vous soyez bien fort.*"

is the result, but whether or not the object is designed is doubtful. The different varieties of cabbage that have been developed from the wild plant, among them the cauliflower, illustrate that utility may be the consequence of monstrous development in vegetal life. No one, however, can attribute beauty or utility to any human or animal monstrosity: nay, life itself



is impossible for the great majority of grave deviations from the normal among these, and it is true that monsters do not beget monsters.

The transition from monsters in the human, animal, and vegetal worlds, to monsters in character or conduct among human beings is natural. More than one Roman emperor has been called a monster of cruelty, crime, or lust. Voltaire said that there were two monsters that ravaged the world in times of peace; these monsters were calumny and intolerance; against them he would fight until he died. Livy wrote: Ingratitude is that which most deeply wounds a noble soul; it is the greatest moral monstrosity of nature. A Roman poet has written: *Ingratum si dixeris, omnia dicis?* And Swift said, None but direct villains are capable of wilful ingratitude. Thus men are justified in pronouncing the ingrate a monster who should at least be sent to Coventry.

I have sometimes thought that the development of moral monsters is much more frequent than the occurrence of physical monstrosities, and that the tendencies of human nature to evil were very great, and just as we read in Plato that it is easier to do harm than good to a man in Athens, so it is to-day almost everywhere. It is a striking fact for those who uphold the intrinsic nobleness of human nature, that the authoritative assertion has been made, you may find ten men who can successfully take the part of Mephistopheles for one who can take that of Parsifal.

The question of the influence of the mother's mind, so-called maternal impressions, in producing human monstrosities is one in regard to which contrary opinions still prevail. Lord Bacon apparently believed it, as he wrote upon the power of the imagination, making the first of the three kinds, that "upon the body of the imaginant, including likewise the child in the mother's womb." Faith in such influence lessens as science grows. Why these monstrosities in the animal and in the vegetal worlds? And admitting the existence of mind in animals, why are monstrosities most frequent among domestic animals that have the least mind, the swine?

So too, the cases in which mothers fear

their children will be "marked" are so many in which the fear is not realized as to make me skeptical. The difficulty of explaining how a mental impression of the mother can act upon the fetus, without any nerve-pathway for transmission, increases that skepticism. Many of the so-called monstrosities are simply arrests of development, and in inferior existences may be made artificially.

Still there occasionally occur in the human family instances of deviation from the normal that for the present seem inexplicable, without the admission of the hypothesis of "maternal impressions."§ It may be, as Tesla has recently shown, that since the transmission of electricity can be made without a conducting wire, so mental or nervous influence may pass by hitherto unrecognized media. Still more, the marvelous facts of telepathy, especially as made known by the London Society for Psychical Research, tell us of spiritual forces instantly acting, though sea or continent separate the origin of the power and the place of action. Here are marvels that for the present baffle reason.

Two years ago in crossing the Atlantic, a fellow-passenger, a name well-known in literature, and the son of one of the most distinguished American women, narrated the following incident as having occurred to his mother.\*\* This lady was unexpectedly called to a distant part of the country, and, at the end of her first day's travel, stopped for the night at a hotel in a town in New England which she had never visited, and where she had no acquaintance. Retiring between eleven and twelve, and falling asleep, in a little while she was roused from rest, by the agonizing cry, "O! mother, save me," and by this same cry her sleep was repeatedly interrupted during the night. She was one of the strong-minded of her sex, perfectly free from any superstitious sentiment: but, anxious for an explanation of the strange occurrence, in the morning she asked for the housekeeper. The latter, after the incident was narrated, replied: "I am so sorry you were put in that room! It was occupied

§ Dr. Creighton (Encyclopædia Britannica) writes: "Maternal impressions during pregnancy have often been alleged as a cause, and this causation has been discussed at great length by the best authorities. The general opinion seems to be that it is impossible to set aside the influence of subjective states of the mother altogether."

\*\* In publishing this incident I omit the names, though giving them in presenting the paper before the Society.



the previous night by a young man who was dying of delirium tremens, and all night long, his piteous prayer was, "O! mother, save me." I have nothing to add to this incident, and cannot tell how this dead man spoke several hours after life had departed. Nor do I know how the mother's mind may act upon the unborn child; nevertheless the possibility of such action I cannot doubt.

Passing from these speculative views, I present two specimens of monstrosity, one human, and the other occurring in the swine. The former is a Cyclop, or a round eye. Taking the description given by Tarnier and Budin, it possibly would be classed as a rhinocephalus, the nasal apparatus not having entirely disappeared, but being represented by a tube inserted at the base of the forehead; but as the most distinctive feature is the single round eye, it seems to be better to call it a cyclop, the name determined by that which is present rather than by that which is absent, or only imperfectly represented. It has been suggested that the origin of belief in the cyclops was from the fact that men among the Pelasgians, working in quarries, carried a lamp upon the forehead, as miners now do, so that they could see in the darkness under ground. We all know Virgil's description of a Cyclopean monster:

Monstrum horrendum, informe, ingens,  
cui lumen ademptum.

So too, in Homer's *Odyssey*, when Ulysses and his comrades are in the Cave of Polyphemos, the wily leader finds

A tree of stateliest growth, and yet undried,  
Green from the wood, of height and bulk so vast,

The largest ship might claim it for a mast,  
and has his comrades prepare this, the top cut off, and the "narrower end sharpened to a spire, and hardened by the force of fire," and with the assistance of four of them to plunge, when the giant sleeps, "in the broad orbit of his monstrous eye." But such description and recital seem ludicrous when we look at the diminutive cyclop here presented.

The second specimen is one of a polymelic pig. As will be observed it has eight legs. I am not sure whether this is simply an imperfect double, or a triple monstrosity, the decision resting upon the question as to whether these additional limbs belong to one or two. However, without discussing the point, it is probably better to consider it as simply a polymelic monstrosity.

I cannot refrain from referring to the absurdity of calling a female child, as is frequently done, Amelia, if we have any regard to the etymology of the name. Of course it would be a proper designation for an infant born without upper and lower limbs, but for an infant having these members, it is utterly inappropriate. It might be added that it is probable Isabel should be a forbidden name for a Christian girl, for it seems from Renan's researches the word Jezebel in its proper form is Ysabel, apparently the origin of Isabel.

Want of time has not permitted any reference to giants and pygmies as examples of human monsters.

## DISCUSSION.

DR. EDWARD JACKSON said that one of the strongest cases in favor of maternal impression was reported by the late Dr. William Hunt. It occurred in the Pennsylvania Hospital, where a pregnant woman was brought with very extensive burns of the surface, as a result of which she died. Dr. Jackson did not remember whether she was delivered before death, or examined post mortem, but the child's surface showed a very close resemblance to the surface of the mother, an acute skin-lesion similarly distributed. All the special senses, the power of certain living tissues to react to particular external stimuli, come by differentiations arising in an originally homogeneous bioplasm. It is conceivable that at an ear-

lier stage this bioplasm possesses a general power of reacting to impressions which does not depend upon any special organization as that of the nervous system. Such a power, the power of reacting to powerful impressions made upon the mother, would probably be of the highest use to the unborn child. But it might be an extremely dangerous capability after the individual had begun a separate individual life and at an early age it would be lost. It seems that the absence of any demonstrable nervous connection, of any specialized channel of communication, between mother and fetus is not a sufficient reason for throwing out cases of apparent maternal impression.

## THE OPTICAL TREATMENT OF VERY HIGH MYOPIA.

EDWARD JACKSON, A.M., M.D.

[Read June 9, 1897.]

The value of the operative treatment of high myopia depends on the insufficiency of other measures. There can be little question as to the seriousness of the condition when not treated by some efficient method. The pictures of the helplessness and unhappy plight of the myope of high degree that have been drawn by the advocates of operative treatment are vivid and perhaps sensational; but they are not false or materially exaggerated. There can be no question but that such a myope needs help; and he is likely to appreciate the restoration of his vision as highly as the patient with cataract. The essential question is, "Cannot this help be given, cannot vision be restored, without removal of the crystalline lens?" In most cases of very high myopia I believe it can.

*Treatment by Glasses.*—The statements of the more enthusiastic advocates of the operative treatment reveal pretty clearly that they do not know how much relief can be afforded by glasses. Fukala proposes operation for cases of myopia of 13 D. and upward; and says he has never seen but one case having very poor vision in which lenses of 18 D. could be worn. I have seen the highest degrees of myopia and the larger number of myopes in dispensary practice; but among one thousand cases in private practice I find the following:

CASE I.—Mrs. R., aged 31, very nearsighted from early childhood, wearing right and left—9 D. sph., under a mydriatic was found to require the following:

Right.—14 D.—2.50 cyl., ax. 15°.

Left.—20 D.—2. cyl., ax. 180°.

With these lenses her vision was 4-9 partly in the right eye, and 4-20 in the left. The constant wearing of these glasses entirely relieved her symptoms, which induced chronic inflammation of the lids and repeated styas. After four months she had become quite accustomed to them and felt that if her "eyes would

only stay as they were" she would be "quite satisfied with her sight."

CASE 2.—Miss T., aged 52, a librarian, constantly reading and writing, previously wearing—8 D. sph., was found to require right—15, left—14 D., giving vision equal to 15-20 partly in each eye. These lenses she wore constantly, except for near work, when lenses 4 D. weaker were employed. Although the wearing of strong lenses was commenced after 50 years of age they soon became entirely satisfactory, and the patient has for three years suffered practically no disability from her high myopia.

CASE 3.—Mrs T., aged 56, with

Right.—13 D. sph.

Left.—13 D. sph.—1 D. cyl., ax. 170°, had vision of 4-9 partly. With the foregoing for distant vision she was given lenses 3 D. weaker for near work. A year later the eyes were well and the glasses satisfactory.

CASE 4.—Mrs. K., aged 46, wore with comfort for distant vision:

Right.—16 D. sph.

Left.—17 D. sph., giving vision 4-12 partly, with weaker lenses for near work.

The citation of other cases is unnecessary. I have seen still stronger lenses (in one case 23 D.) used with comfort. Very high myopia is, at least in Philadelphia, so unusual that no one observer is likely to encounter very many cases; but such cases are reported by others. Harlan reports\* two such cases, of especial interest on account of the long time they were under observation. One patient wore —16 D. sph. lenses, giving vision of 20-50, with no increase in myopia or diminution in vision in seventeen years. Another patient wore —14 D. sph., giving vision of 20-50, and at the end of sixteen years had an increase of only 1 D. in the myopia, and no diminution in vision.

It seems to me abundantly established

\* Transactions of the American Ophthalmological Society, 1892, page 295.

that such strong glasses can be worn, and worn constantly; not only with benefit to vision, but with the greatest possible safety to the eye, and with the best prospect of retaining vision without further deterioration. That the opposite view should be held and advocated may seem strange, yet this error is one that can be readily explained.

*Why correcting lenses are not appreciated.*—In the first place, such lenses can prove satisfactory only when accurately adapted to the eye. They must be of just the right strength, with the right cylindrical element turned in the proper direction, and so mounted as to reduce to a minimum the unpleasant effects of strong lenses and give the maximum of service.

Again, there has been an unfounded fear that myopia is liable to be increased by normal use of the accommodation. That such a fear is not well grounded I have tried to show in a paper read before the American Ophthalmological Society in 1892,<sup>†</sup> including reports of 27 cases of myopia under observation from three to nine years, while wearing their full correcting lenses. In the discussion of that paper it came out that several myopes among the ophthalmologists present were themselves all wearing full correcting lenses, without any evidence of harm. That excessive or abnormal accommodation may lead to increase of myopia need not be disputed. The error to which attention is called is the belief that the myopic eye cannot exercise normal accommodation or is injuriously affected by it.

Another error, on which the fear of strong concave lenses is based, lies in the reasoning that, as lenses incompletely correcting myopia often prove very injurious, stronger glasses would necessarily prove more injurious. As I have pointed out in the paper referred to and elsewhere,<sup>‡</sup> the incomplete correction of myopia is certain to exert a very harmful influence, which the complete correction never exerts. The incompleteness of the partial correction is partly overcome by looking obliquely through the lenses; and thus increasing their effect. If the correction is incomplete the myope can thus improve his distant vision, but

only by introducing an astigmatic effect that is altogether harmful. With glasses that do not quite correct his myopia, the myope has the constant temptation to look obliquely, so as to see more clearly; and he does so at the cost of very serious eye-strain.

The complete correction of myopia on the other hand, gives the best vision of which the eye is capable when the glass is in its proper position, and the visual axis perpendicular to it. Any departure from this relation of the visual axis to the lens makes vision worse, so that with the full correcting lens the myope has every inducement to use his lenses properly. As a matter of fact, the disastrous increase of myopia so often noted with incomplete correcting lenses does not occur when the full correction is worn.

Still another cause for the impression that high myopia cannot be relieved by glasses is found in the difficulty of becoming accustomed to such glasses. Correcting lenses are never fully satisfactory when first worn. Only incomplete corrections are the best at the start. The difficulty of becoming accustomed to correcting lenses increases with the age at which one begins wearing them, and is in some measure proportionate to the strength of the lenses. Very high myopia is usually found in adults, often in those who have reached or passed middle life. Hence, correcting lenses for high myopia usually entail much difficulty when first worn, and some time must elapse before their beneficial effects are manifest. The patient who has not enough faith in his medical adviser to overcome this first difficulty, as well as the ophthalmologist who has not enough confidence in his own work to withstand the first impression of the patient, is therefore, pretty certain to condemn the correcting lenses for very high myopia. Like other good things their benefits cost something, and those who will not pay the price; will not suffer temporary annoyance, cannot secure them.

The foregoing cases give my experience with three older patients, and I have not yet encountered a patient under 40 years of age who was not able ultimately to wear with comfort his or her correcting lenses, if a fair effort was made to do so. The inconvenience encountered in becom-

<sup>†</sup> See *Transactions*, page 359.

<sup>‡</sup> *Journal of the American Medical Association*, November 19, 1897.

ing accustomed to such lenses seems to me, and to most patients, trifling as compared with the risk, loss of time, and difficulty attending removal of the crystalline lens.

*Cases for Operation.*—For the mass of cases of even very high myopia, therefore, I believe that operative treatment should not be considered. Still, this probably has a certain limited field of usefulness. In the first place there are cases of high myopia in one eye, with the other eye slightly myopic or even hyperopic. Patients thus affected can never get binocular vision through a lens correcting the monocular myopia. The usefulness of the defective eye, and the chance of some binocular vision, will be greatly improved by removing the crystalline lens from the myopic eye. The difficulty in applying the method to cases presenting such a condition is that the patients, having good vision in one eye, do not care to undergo the trouble and expense of having the defective eye operated upon.

Secondly, in cases of high myopia, with slight opacity of the crystalline lens, it has seemed to me proper to remove the lens, when if the refraction had been more nearly emmetropic the condition of the lens would not have justified operative interference. Such cases I have treated by the usual method for extraction of unripe cataract, with or without previous massage of the lens, rather than by the plan indicated by Fukala.

Finally, there are some cases of very high myopia among the illiterate workers at coarse kinds of manual labor, who will not wear glasses; who would find glasses an inconvenience and a serious expense; and yet who are practically blind for much of the class of labor that they are otherwise able to perform. For these the extraction of the lens seems to me a perfectly proper procedure, and one to be distinctly advised, especially as the degree of vision afforded by the operation will serve their purpose without their having to still use the glasses that would be required by those needing more accurate vision.

*Risk of Operation.*—I cannot believe that the removal of the clear lens from the myopic eye is so free from danger or promises such immunity from further degenerative change within the eye as some of its enthusiastic European advocates

claim. The extraction of unripe cataract, and the extraction of cataract from highly myopic eyes, are operations familiar to ophthalmic surgeons the world over. They have a record running back long before Beer's proposition was made in 1817, or systematically acted on by Fukala in 1887; and it is universally agreed that they are not without risk. The extraction of unripe cataract is not under any circumstances perfectly safe, and is probably attended with a little higher risk than the extraction of mature cataract. The prognosis for highly myopic eyes is never so good as for eyes not myopic before they become cataractous. In the face of this general experience of the profession the claim that the removal of the clear lens is entirely without risk in cases of very high myopia seems like a pretty clear case of zeal outrunning judgment.

I have now a case at Wills' Hospital in which the lens was extracted for myopia nearly two months ago. The eye has been continuously irritated, or the seat of a low grade of irido-choroiditis, with development of additional vitreous opacities up to the present time; and vision is now but slightly better than it was before the extraction of the lens, and not nearly so good as correcting lenses gave before operation. It is not unlikely that this eye will continue to improve until it gets useful vision; but evidently the risk of operation is not so slight a matter as some writers attempt to make it. Indeed, the statement that six or eight weeks are required for the treatment before the eye returns to its normal condition indicates strongly that such a course of protracted inflammation, attended perhaps, as in this case, by increased opacity of the vitreous, is not a rare occurrence.

*Subsequent Decrease of Myopia.*—Some of the reports speak of decrease in the degree of myopia occurring subsequently to the removal of the lens—a progressive decrease, which they are inclined to ascribe to some mysterious influence of the operation upon the nutrition of the eyeball. Such a change of refraction is to be noted after the extraction of cataract or other extensive section of the cornea. It depends on post-operative changes in the curvature of the cornea, and return of the cornea to its normal position, as the cor-

neal wound becomes consolidated and the eye-ball assumes its normal shape. Thus, in one of my recent cases of cataract-extraction the first trial with lenses two weeks after the operation showed the refraction to be corrected by:

+3.50. sph. +11. cyl., ax. 30°. V.=5-15.

One month later the refraction required:

+10. sph. +6. cyl., ax. 25° V.=5-10 partly.

Such an increase of hyperopia is the almost universal rule after cataract-extraction, and the change may go on for many months. Its equivalent, the diminution of myopia when the eye is highly myopic before the lens was removed, is only what would naturally be expected from any operation involving a considerable section of the cornea; and while it is not impossible that the removal of the lens may improve the nutrition of the highly myopic eye-ball, such observations do not at all prove it.

*Conclusions.*—It is likely that the operation of removal of the crystalline lens for

high myopia has a proper place and will sometimes prove of decided service. It is almost certain that, like other operations, it will make the best statistical showing when performed in cases that could be better treated by less severe methods; and that when confined to the cases that are not amenable to correction by lenses, its field of usefulness will be small and the success to be achieved with it not very brilliant.

For the mass of cases of very high myopia the treatment will continue to consist in correcting lenses, particular supervision of the amount and conditions of near work, and the use of appropriate remedies for the diseased conditions of the posterior coats of the eye that complicate high myopia and favor its increase. For a few cases, Fukala's operation is a positive addition to our therapeutic resources.

The great thing to do for very high myopia is to prevent its development by the proper management of myopia of lower degrees.

## THE PROPOSED OPERATIVE TREATMENT OF HIGH MYOPIA.

T. B. SCHNEIDEMAN, M.D.

[Read June 9, 1897.]

Within the past few years operation for the relief of myopia of high degree has gained extraordinary headway upon the continent of Europe. The procedure consists in removal or destruction of the crystalline lens, and appears to have been accepted with enthusiasm by the most eminent oculists. Prof. Vossius declares that the operation is to be placed upon the same plane as that of iridectomy for glaucoma. Prof. Cohen, of Breslau, ascribes a more beneficent effect to this procedure than to the operation for cataract, for the former, he states, gives the blessing of sight to the young, who have never enjoyed it, while the latter restores it to the aged, who have the memory of their former power, and who will live to enjoy the same, as a rule, for but a limited time.

The introducer or reviver of the operation is Dr. Fukala, now of Vienna. In

myopia the images of distant objects are formed, not upon the retina, but in front of that membrane, in the vitreous humor, owing to increased length of the eye-ball. This condition is irremediable; it can in a measure be compensated for by displacing the focus further backward so as to bring the images upon the retina. This can be effected either by a concave lens or, by what amounts to the same thing optically, the removal of the natural biconvex lens of the eye.

Fukala and his followers assert that while it is possible theoretically to correct high myopia by lenses, like other anomalies of refraction, the glasses cannot be worn. Patients thus treated, he states, are unanimous in declaring that they cannot bear correcting lenses on account of the resulting vertigo, headache and uncertainty of movement. Concave lenses of



high degree possess certain baleful properties which are irremediable. These are principally apparent diminution in the size of objects, and false projection, causing them to appear to be more distant than they really are. For these reasons patients prefer the imperfect vision of the naked eye to the discomfort produced by their glasses. This is the major premise of the argument and the fate of the operation will largely depend upon its acceptance or rejection. Fekala himself admits that if correction by lenses were possible the need of operative interference would vanish.

It is of interest to note that increased length of the eye-ball was recognized as the cause of myopia before the year 1700 by Boerhaave and demonstrated anatomically by Morgagni. Richter, a century later, and not Beer as is usually stated, was the first to propose extraction or couching of the lens for the relief of this condition. Subsequently attempts at cure were made by an orthopedic apparatus (*myopodiorthotikon*), by convex lenses, by concave lenses of decreasing strength, by magnetism and by division of the external muscles of the eye-ball; and favorable results were reported from each and all of these irrational procedures.

In 1858 Mooren, at the Heidelberg Congress, broached the question of extraction of the transparent lens for high myopia. The proposition was received unfavorably, being opposed vigorously by the two great leaders of ophthalmology, Graefe and Donders—by Graefe especially on the ground that posterior sclerotic choroiditis being the cause of the malady, the operation would be incapable of staying the progress of the disease, not to mention its dangers. Donders stigmatized the suggestion as most unwarrantable. In his opinion the resulting aphakia would entail no decided advantage, and, furthermore, the accommodation would of course be sacrificed. Much has been made of this latter point and the loss of the accommodation has been loudly deplored. This objection appears to be the only one that the introducer of the operation thinks it worth while to meet. He argues correctly that the function is of no value to the shortsighted eye without a lens, being indeed under these circumstances a disadvantage, for the effect

of it is to bring the working point, already too near the eye, still closer, and thus prove an active cause in furthering the progress of the myopia. All this is undoubtedly correct. But how does the case stand when the myopia is corrected by a lens? The advocates of the operation dismiss the question with the statement that under no circumstances dare a myope of high degree attempt near work with correcting lenses, which compel the use of the accommodation, as in emmetropia. This assertion, which is the minor premise of the proposition, is, to say the least, open to question.

Whatever may be thought of the operation and what its ultimate fate may be, the experience of those who have practised it has brought to light some interesting and unlooked-for facts. Among these is the knowledge that the loss of physiologic accommodation is not equivalent to entire inability to accomplish near work without a glass; a substitute for this function is furnished by the improved optic conditions of the aphakic eye, as compared with the disadvantages inherent in the highly myopic eye (without a correcting lens). Numerous cases are adduced in which a considerable range of accommodation, or rather ability to distinguish near objects at varying distances with the same glass, was present after operation. Thus in one case:

M. 13 D. before operation, with + 8 Jaeger's No. 7 was read at 12—54 cm.

M. 18 D. before operation, with + 4 Jaeger's No. 7 was read at 12—75 cm.

M. 17 D. before operation, with + 4 Jaeger's No. 7 was read at 15—39 cm.

M. 16 D. before operation, with + 4 Jaeger's No. 7 was read at 18—49 cm.

M. 16 D. before operation, with + 6 Jaeger's No. 7 was read at 35—50 cm.

Another circumstance brought to light by these operations has been the extraordinary diminution of refraction following the removal of the crystalline lens. Whereas the emmetropic eye after extraction of cataract is left hyperopic 10 or 11 D. it was naturally to be expected that removal of the clear lens in myopia would bring about a similar diminution in the refraction. This, however, is not the case; 15 or 16 D. is the rule. In none has it been found to be as small as 10 D. In one case a diminution of 44 D. is reported. This seems to prove that besides increase



in length of the axis another factor comes into account in these high myopias, namely, increased curvature of the crystalline lens. This has actually been found to be the case, as shown by examination of the lens after removal. In other cases the lens was found to be actually less curved than normally. It seems justifiable, therefore, to classify high myopia into (1) pure axial myopia; (2) axial and lens myopia; (3) pure lens myopia. This classification will explain the extraordinary variation in the degree of diminution obtained in different eyes by the removal of the lens.

Some of the indications and counter-indications of the operation follow: Age does not appear to be much of a factor one way or the other; successful results have been reported up to the age of 64; although the younger the subject, other things being equal, the better the outlook. Von Hippel and Sattler have made the important observation that the lens does not undergo sclerosis in high myopia. The visual acuity should at least equal 0.1. Jaeger No. 1—certainly No. 2—should be read fluently. When these conditions are not fulfilled not much is to be expected from the operation.

Complications on the part of the choroid are not to be regarded as counter-indications, provided they are not of high degree. In the latter case hemorrhage or possibly even detachment of the retina may occur. But even when the choroid has suffered seriously, inasmuch as the operation is the only measure that promises anything, it may be justifiable to assume the risk.

Both eyes are to be operated upon.

The operation itself consists of two stages: (1) extensive dissection, (2) extraction of the disintegrated lens. The usual rules of asepsis being observed and the eye cocaineized, a narrow Graefe knife is carried through the margin of the cornea and made to penetrate the lens deeply, which is then to be divided primarily in its center by several (three or four) cuts; if necessary the knife may be entered a second time at the same sitting in order to divide the lens thoroughly by crucial incisions. The patient is to remain in bed the first day. Spasm of the sphincter of the pupil occasionally occurs in spite of atropin; but it readily yields to

cold applications. The second part of the operation consists in extraction of the lens masses. After dissection of the lens, which may have to be repeated two or even three times, sooner or later (often upon the next day) a separation of its substance takes place, and this shortly degenerates into a thickish fluid mass. This fills the anterior chamber, covering the iris. Simultaneously subjective and objective symptoms of irritation arise, which if persistent may lead to loss of the eye from inflammation and increased tension. The subjective symptoms consist of pain in the eye, in the brow along the course of the branches of the fifth nerve, and photophobia, so that the eye cannot be opened. Upon palpation the patients experience a peculiar sensation of pressure and characteristic pain. There is considerable conjunctival and ciliary injection, with lachrymation. The surface of the cornea is lusterless. The tension under these circumstances is always increased. In this condition no time is to be lost; the masses must be extracted at once. The operation is usually performed with a keratome, though a knife may be employed. The incision is to be made at a short distance from the sclero-corneal junction, to avoid prolapse or incarceration of the iris. It may have to be repeated two or three times. It is recommended that the incision in the cornea be made at right angles to the meridian of greatest curvature, previously determined by the ophthalmometer. Cocain-anesthesia usually suffices. In children or nervous subjects and when there is great photophobia general anesthesia is preferable. The treatment covers a period of from three to six weeks. During this time the patients, when necessary, may follow some light occupation or attend school. Physical exertion is to be avoided, from risk of detachment of the retina. Iridectomy is omitted except in the case of older subjects.

The advantages claimed for the operation are: (1) Clear, distinct vision without a lens. (2) Improvement in the visual acuity. The latter is often very great; nine-fold has been noted. It sometimes does not take place until after the lapse of many months. This result is probably to be ascribed to improvement in the function of the retina in consequence of ex-

perience in accurate vision which it had never before enjoyed. (3) Restoration of binocular vision through recession of the far point. (4) Decided diminution in the refraction of the eye. (5) Cessation of the progress of the myopia.

Up to the present time more than one thousand operations have been performed and statistics published. Those who have had experience with the procedure are enthusiastic in commending it.

I have had no personal experience with the operation, but have had the opportunity of following a single case in the practice of another gentleman; and the course of this one, at least, demonstrated that the operation is not so free from risk as the advocates of it claim. The experience of the oculists of this city will, I believe, agree with mine that it is not true that all myopes of high degree are unable to wear correcting lenses. It is altogether probable that those who make this assertion have never given that method a fair trial. Many cases could be adduced in which the subjects were very comfortable with their glasses, and would have little or nothing to gain from removal of their crystalline lens. It is undoubtedly

true that to some concave lenses are a troublesome burden, and these may be fit cases for the operation, but they constitute a small minority. Many others require a different arrangement for near and distant vision; these may be supplied with bifocal glasses, or with two pairs, or perhaps with extra glasses, to be added either to their distance ones for near or to their near for distance, but some plan can almost always be devised.

To correct these cases properly a reliable objective test of the refraction is indispensable in very many instances; the visual acuity is so low that the subjective method alone will often fail to lead to the proper combination of sphere and cylinder, for most of these myopias are complicated with astigmatism, and failure to correct this properly naturally means dissatisfaction with the glasses. So far as concerns the benefits claimed for the operation, these are also to be derived from correcting lenses. Cessation of increase of myopia, recession of the working point, clearer distant vision, restoration of binocular vision, when possible, all these advantages are to be expected from proper correcting lenses.

## DISCUSSION.

DR. W. L. PYLE said that Dr. Schneideman appears not to have spoken of the suggestion recently urged that in cases of very high myopia one lens only be removed, giving the patient one eye for distant vision and one for near vision. Of course, this has the disadvantage of rendering binocular vision impossible.

Dr. Jackson has brought out a very good point in speaking of the mechanical construction of spectacles in this country. Personal observation of glasses ground and fitted for foreign clinics creates the impression that most of the European operators do not have as good opticians close at hand as exist in Philadelphia. It is important further in prescribing glasses to secure the patient's confidence. It seems certain that abroad, where the proposed operation is most in vogue, when patients come in to the clinics and say they cannot wear the heavy glasses required to correct the optic defect there is no attempt to persuade them into wearing them. American oculists, on the contrary, are inclined to inform patients that the first pair of glasses may not be satisfactory, that they must necessarily submit to some inconvenience, and that in three or four months matters will come all right.

Dr. Pyle could not agree with Dr. Jack-

son in advising full correction of myopia. He spoke as a myope from his own personal experience. Some of the worst cases of asthenopia have been in myopes wearing full correction, or over-correction. There is a strong tendency to over-correct myopia, particularly if a cycloplegic is not used. For moderate myopia Dr. Pyle would prescribe an under-correcting glass, particularly if the patient were a literary person, and such a compromise glass can be worn constantly until the presbyopic age. In some cases bifocals may be prescribed for young adults.

DR. JAMES THORINGTON said, in regard to the ordering of glasses for myopes, that his experience, especially in clinical work, has shown a certain class of patients who are comfortable with a full correction for all kinds of work, and another class who are not. In other words the attempt should be made to adapt glasses to each individual case and not to lay down any rule for all. For instance, a patient wearing a minus 2 diopter sphere before each eye had an estimated myopia of 25 diopters. When this correction was put before her eyes, she became dizzy and nearly fell from the chair, and asked to have the glasses removed at once. By careful explanation this patient was gradually gotten to wear minus 18 di-

opters before each eye, with great comfort and satisfaction. Dr. Thorington has found the use of the full correction for all work very satisfactory in most cases when the strength of the glasses did not exceed 6 diopters, although some of these will come back complaining of the brightness of objects, and the strength of the glass will have to be reduced. One young lady who wears 5 diopters before each eye prefers her full correction for all purposes and when an attempt was made to reduce the correction 1 diopter, she returned and asked for the full-strength lens. As to the operative treatment for high myopia, the young lady who was wearing 18 diopters for distance and near refused an operation when she learned that she would most likely have to wear two pair of glasses after the operation. The one thought alone of having two corrections destroyed all assurances of improved vision after the operation.

DR. S. LEWIS ZIEGLER said that during the past year he has operated on two cases of high myopia, one by the method of extraction and the other by dissection of the lens. The latter method is preferable in young persons, at least when the lens is soft, although when the lens has become more hardened the method of extraction is to be preferred.

In one of these cases the refraction after operation was  $S + 3 D.$ , and in the other  $C + 3.50, + D., \text{axis } 10^\circ$ . Both patients expressed themselves as having far better, clearer and more definite vision than they had previously enjoyed, and were gratified with the result.

In prescribing lenses for cases of high myopia, Dr. Ziegler always orders the full correction for distance, and a weaker correction for reading or near work. These are conveniently combined together in what is known as the ground bifocal, in which the upper portion of the lens is ground stronger than the lower, in this way avoiding the use of a cement bifocal slip on a concave lens, which requires a very high prismatic edge in order to place the reading center in its proper position.

DR. LOUIS J. LAUTENBACH said that he has not operated upon any cases of myopia by the method described and he thinks, so far as a city such as Philadelphia is concerned, full of first-class oculists, there would be difficulty in obtaining the patient's consent to such a procedure. The amount of good accomplished in other ways is so great and constant that one would be justified, even in case of high myopia, in giving the patient the assurance of great benefit without operation. The tendency of the public to-day is rather against operation. They understand fully that the trend of the last ten years in the medical profession has been toward operation, but they are beginning to object, and the medical profession has begun to lose much of its enthusiasm for operating.

Patients will scarcely listen, in any great

degree at least, to the question of operation unless it is a matter of necessity. This operation does not present an attractive prospect to anyone who can be made to see at all by means of glasses. The ordering of correcting lenses by American oculists and their fitting by American opticians give promise of a great deal of good and, when, in addition, it is considered that the eye-physician of to-day does not think his duties ended with the ordering of the glasses, but believes his work has but commenced, and patients realizing that when they put themselves in the hands of such a one and allow him to treat the choroid, the staphyloma of the diseased eye, as he only can, with benefit so great that they will rarely demand operation, but rather avoid it, the difference between American and European methods will be more thoroughly understood. Taking all things into consideration, it is the doctor's duty to do the greatest amount of good possible with the least amount of danger to the patient.

The public has a right to demand the sacrifice of the least possible of function and organization, with the greatest relief obtainable. As soon as the question of operation is raised in such cases the patient will want to know why—the reason, is there no other method? Can nothing else be done? Is it the very last straw? Can you not do something further than you have done and thus avoid the operation? The ordering of myopic glasses seems theoretically a simple one, but practically it is a complicated one. Theoretically absolute measurements can be obtained, and glasses corresponding ordered, but it were better to order glasses rather in accordance with the practical needs of the patient, adapting them to his particular occupation, environment, etc., in some cases ordering full correction for distance and weaker myopic glasses for near; in other cases full correction glasses even for distance, hoping that the choroidal conditions may have a better opportunity for subsidence; again, in other cases, less than full correction for constant use. In other words the glasses should be so adapted as not only to fit the patient's eyes, but also to give him ease and comfort and allow him at the same time to do his necessary work, without danger of overstrain or imperfect definition.

DR. EDWARD JACKSON said in reference to the full correction of myopia, that he did not mean to say that he fully corrects all cases of myopia. He merely makes full correction the rule, and departs from that rule only for some clear and definite reason.

There can be no question but that the point mentioned by Dr. Pyle is the point of divergence between the practice in Philadelphia and the practice in the larger European centers. It is the question of accurate work with glasses, not only accurate measurement of the refraction of the eye, but also the accurate mounting and adjustment of the glasses throughout.

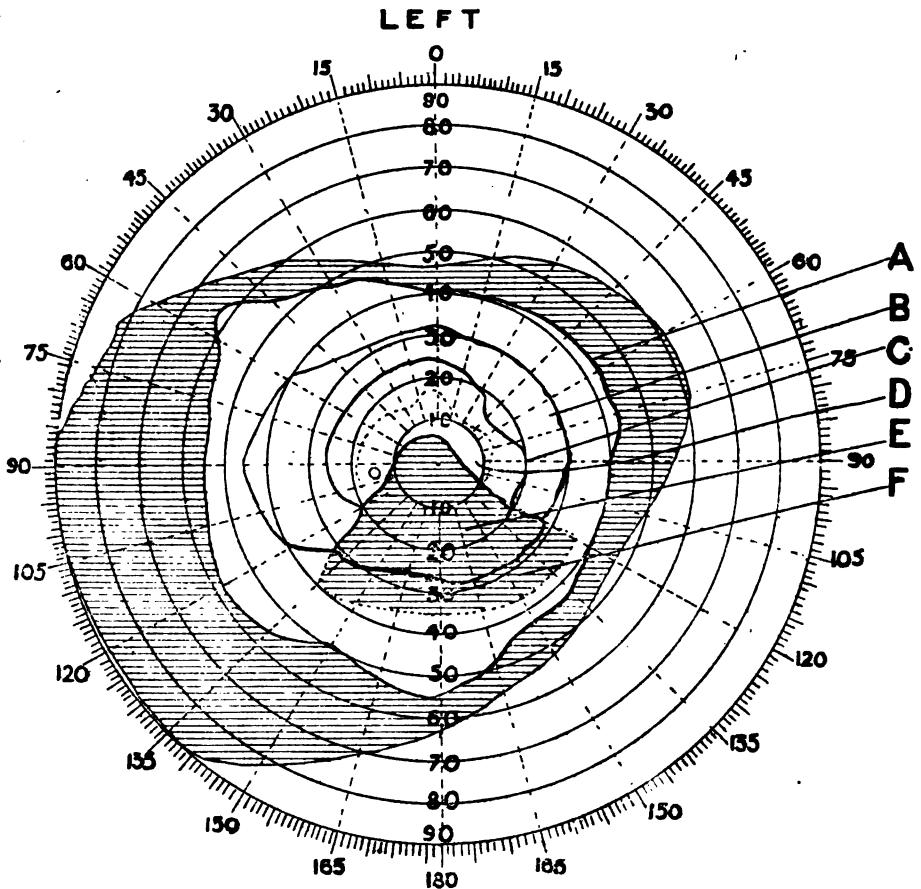
COMPLETE BLINDNESS DUE TO ACUTE POISONING FROM OVER-  
USE OF JAMAICA GINGER; RECOVERY, FOLLOWED BY  
TOXIC AMBYLYOPIA OF ORDINARY CHRONIC  
FORM, WITH EVENTUAL ATROPHY.

ARCHIBALD G. THOMSON, M.D.

[Read June 23, 1897.]

The case about to be reported presents several interesting points which may throw light upon or help to confirm some of our ideas on the subject of toxic amblyopias.

solutely any venereal disease. He had never been a steady drinker, but from his occupation as a sailor would abstain from alcohol for several months at a time, on reaching shore going off on a spree for a



J. R., a sailor, 32 years, related that his mother and father were both dead, from causes to him unknown, had had the diseases of childhood, but had never suffered from any serious disease. He denied ab-

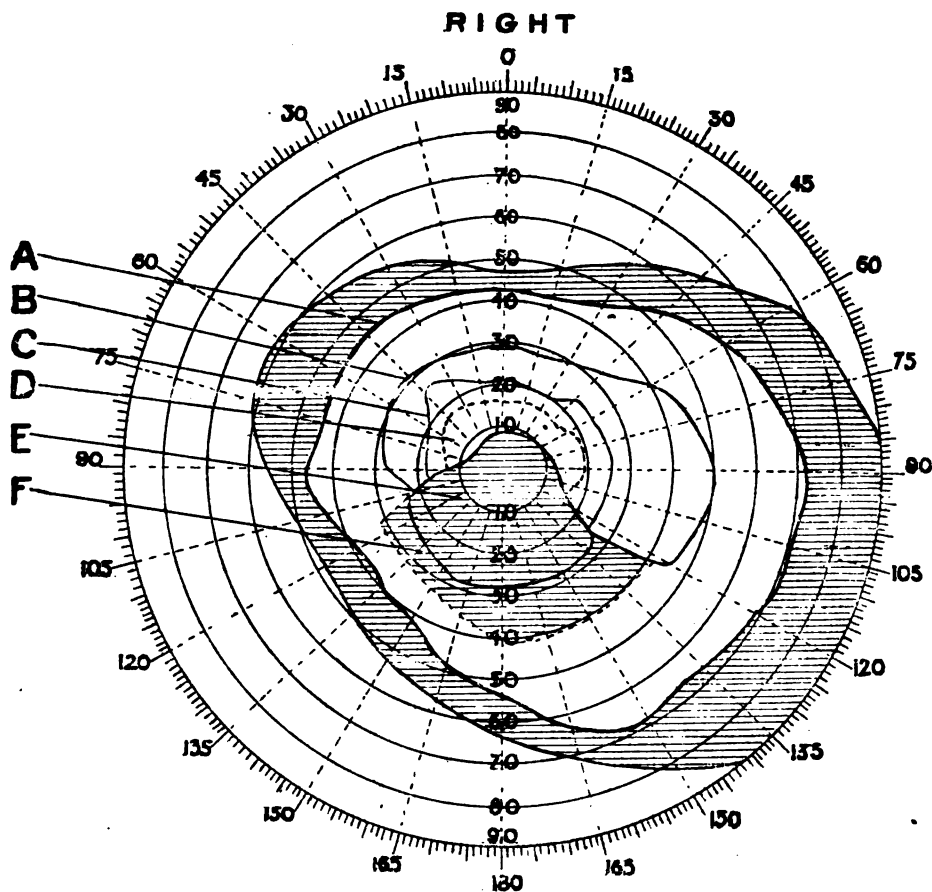
couple of days two or three times in the course of a year. He had been moderate in the use of tobacco, smoking weekly about four ounces in a pipe. His eyesight had always been good until about December

22, 1896, when he came ashore from a cruise and with a party of friends, being unable to procure whisky, got intoxicated with Jamaica ginger of the ordinary commercial kind sold in small country stores. This was taken, as whisky is, with water. The man remained drunk for two days, estimating that during that time he took about a quart and a half of Jamaica ginger. On the following day the man's feelings were similar to those that ordinarily follow an alcoholic debauch, though greatly intensified. Among other things he suffered from headache, nausea and vomiting.

On the evening of the next day, the fourth from the first taking of the ginger,

a lighted match held directly before his eyes, but had peripheral vision sufficient for him to grope around. By the following morning, however, light-perception had absolutely disappeared, both central and peripheral, and blindness was complete. This condition lasted for seven days, when vision began gradually to return, first in the periphery of the field, the man finally being able to read large print with great difficulty.

The time that elapsed between the period of complete blindness and the recovery of vision the patient estimated at about four weeks. Matters remained thus stationary for three weeks, when vision again began to fail, now very slowly, un-



while lighting the lamp in the cabin the man noticed everything to be hazy and vision failing, together with some photophobia.

By the next morning he could not see

til the present condition has been reached, three months and a half after taking the Jamaica ginger.

The anterior aspect of the eye is apparently normal, cornea and conjunctiva.

The pupils are slightly dilated, but react both to light and in accommodation.

$$\frac{V}{L} = \frac{R}{L} \text{ Fingers at 1 meter.}$$

L. 1-100, eccentric.

On ophthalmoscopic examination the media are found to be clear. The discs are exceedingly pale, the capillaries being almost entirely absent. The portion of the discs occupied by the papulo-macular bundle of fibers (forming the lower and outer quadrant) is completely atrophied and greenish-white in color.

The fundus of each eye is otherwise normal. There is a well-marked physiologic cup and an absence of lymph from the vessels, showing the atrophy to be primary and not secondary to a previous papillitis.

There is no evidence of cerebral or spinal trouble (no locomotor ataxia or disseminated sclerosis) or hysteria.

The patient states that one of his friends, who accompanied him on his debauch, has also marked disturbance of vision, though in less degree. Under treatment this entirely disappeared.

On questioning the man more closely some three months after I first saw him, he stated that since his visual loss he has heard of several other cases in which the sight was affected by drinking Jamaica ginger and that the practice of using this as a beverage is quite common in districts where it is difficult to procure alcohol.

The case thus presents several very interesting features:

1. The uncommon nature of the agent producing the poisoning.
2. The suddenness of the attack of complete blindness.
3. The peculiar changes in the fields, which correspond most probably with the pathologic condition that takes place in the nerve.

There is a difference of opinion between authorities as to whether alcohol adulterated with certain substances is more or less liable to produce toxic amblyopia. However this may be, I think it is generally conceded by all that the cheapest and worst kinds of alcohol are more likely to bring about this condition.

I have been unable to procure a specimen of the kind of Jamaica ginger taken by the patient, which he describes, however, as being the ordinary commercial

kind; so I wrote Professor Remington, of the Philadelphia College of Pharmacy, asking if he could inform me as to the ingredients contained. To my inquiries I received the following courteous reply:

"What is known as Jamaica ginger, or more properly, essence of Jamaica ginger, is made in a very simple manner, by percolating the ground ginger-root with alcohol or alcohol containing water. The cheap trash found in country stores is often made with a portion of capsicum, in this way saving expense. You can see that a very little capsicum would take the place in pungency of a large quantity of ginger. Of course, sufficient ginger would have to be used to give a flavor to the decoction. Then again, if it is made hot with cayenne pepper a weaker alcohol can be used, and this would cheapen the product very much."

From the suddenness of the blindness, the profound condition following and the history of several other men being affected, it would seem as if the presence of foreign materials in the spirit would be the more likely to cause amblyopia.

The fields are most interesting, as I think they clearly indicate the pathologic process that has taken place in the nerve.

#### FIELDS.

##### Description of fields:

- A. Form field.
- B. Blue field.
- C. Red field.
- D. Relative scotoma for red.
- E. The heavily shaded portion, positive scotoma, both for form and color.
- F. Lightly shaded portion relative scotoma (Form is perceived badly, i. e., white appears dirty, not clear, as in other portions of the field).

As no post-mortem examination has been reported in an acute case of this character, and as there is primary atrophy of the optic nerve, I take it that the following series of changes have taken place in the nerve: First, from the profound poisoning there resulted an acute interstitial retro-bulbar nervitis or effusion into the sheath of the nerve, affecting, as alcohol always does, the papulo-macular bundle of fibers, and producing, most probably, at first a central scotoma, negative in

character (that is, for colors and not for form), with the resulting blurring on the first day. As the neuritis or effusion increased and the pressure on the axis-cylinders became greater the scotoma gradually changed from negative to positive and finally became larger and larger until it spread over the entire field, causing complete blindness. After the seven days of blindness, as the neuritis or effusion subsided, the pressure was relieved and vision gradually returned, with the exception of that effected through the papulo-macular bundle, which, owing to its depth in the nerve, was more seriously affected by the pressure. The renewed failure of vision

after three weeks is to be attributed to a consecutive atrophy following upon the pressure exerted upon the axis-cylinders as a result of the neuritis. This sequence is clearly demonstrated by the interesting fields, showing the "breaking through of the scotoma" to finally meet the periphery of the field, indicating not only an atrophy of the macular bundle, but its extension to adjacent fibers. The portion of the field represented by the letter F shows that the fibers of this region have not undergone complete atrophy, but are damaged so that they will not respond with the same promptness to the vibrations of light as the other portions of the field.

## DISCUSSION.

DR. G. E. DE SCHWEINITZ said that, so far as he knows, from an extensive acquaintance with the literature of the subject, the case reported is the first of toxic amblyopia following the abuse of Jamaica ginger, and the paper for the first time calls attention to the ocular lesions that may follow the excessive use of this drug. It is not surprising, however, to hear that optic-nerve atrophy may follow excessive indulgence in Jamaica ginger, although that it should come on acutely, as has been described, is worthy of special remark. Dr. de Schweinitz has been told by a college-mate who lives on the northern border of Pennsylvania that persons in the vicinity who cannot obtain whisky are in the habit of indulging excessively in the use of Jamaica ginger, and as a result there arises a species of drunkenness far more uncontrollable and disastrous in its effects than that which follows the free imbibing of alcoholic spirit. Therefore it is not surprising that the optic nerve should suffer in the way that has been described.

Dr. de Schweinitz referred to a case already reported, in which the visual fields closely resemble those described by Dr. Thomson, in which the disorder was due to the toxic effects of alcohol and tobacco combined, or else was a type of progressive scotomatous optic-nerve atrophy that may have resulted from inherited tendencies. Therefore it is not surprising that the patient ultimately became entirely blind. An examination of the charts shows how closely they resemble those of Dr. Thomson's case, save only that the process has progressed much further and the atrophy has become more extensive. In fact, this patient ultimately became entirely blind. The scotoma, beginning in the center and representing disease of the papillo-macular bundle, gradually increased until it broke

through and met a peripheral contraction of the visual field. Finally, the peripheral and intermediate bundles of the optic nerve became affected, and vision was gradually destroyed.

Although it is not known exactly what principle it is in alcohol, or, indeed, in any of the toxic agents, that causes these forms of amblyopia, it seems likely, in spite of some assertions to the contrary, that the poorer the quality of the alcohol, the more likely the development of toxic effects. Recently Dr. de Schweinitz made an autopsy in the case of a man—the nineteenth—dead of pneumonia, who for some years before his death was a typical example of so-called toxic amblyopia, presenting the usual central negative scotoma. The specimens have already been demonstrated before the American Ophthalmological Society, but the charts show beautifully the circumscribed atrophy of the papillo-macular bundle throughout its entire course, the atrophy being ophthalmoscopically manifest as a quadrant-shaped patch of discoloration in the lower and outer portion of the optic disc and, microscopically, as a degenerated bundle occupying first the lower and outer portion of the nerve, gradually reaching its axis, then sinking to the lower portion of the nerve, passing through the chiasm and finally losing itself in the optic tract. There is some doubt as to the exact pathology of cases like this, that is to say, whether the atrophy is primary or is preceded by neuritis. Dr. de Schweinitz holds that there is an interstitial neuritis, with thickening and changes in the interfascicular septa, which then press upon the nerve-fibers and destroy them. The process has been compared with the sclerosing inflammation found in chronic hepatitis of alcoholic origin. Recently a theory has been revived by Nuel that the primary

effect of these poisons falls upon the ganglion-cells of the macular region, atrophy of which is followed by an ascending degeneration of the optic nerve. While both clinical and experimental evidence goes to prove that atrophy of the ganglion-cells of the macula does cause degeneration in the papillo-macular tract, a case like Dr. de Schweinitz', in which the ganglion-cells were normal, indicates that they are not always the starting point of the disease, but that alcohol, tobacco, or whatever other drug may be regarded as the toxic agent, or else the toxin that it liberates in the system, may sometimes, and probably usually, affect primarily, the fibers of the optic nerve. Recent investigations, particularly in Chicago by Casey Wood, Klebs and Turck, indicate that certain toxins may be liberated in the stomach that in turn have the power of causing blindness. It is a curious fact that tobacco amblyopia almost never occurs unless there exists marked gastric disturbance, or, at all events, other disturbances than those merely connected with sight. Its victims frequently suffer from insomnia and chronic indigestion. This is noteworthy because Dr. Thomson's case, which really was a form of poisoning with a mixture of bad alcohol, poor ginger and cayenne pepper, may perfectly well be explained, if this theory is accepted, by the hypothesis that some active toxin was liberated which was the mischievous agent. Dr. Thomson's communication is a most important and interesting one, and adds not a little to existing clinical knowledge of the interesting subject of the toxic amblyopias.

DR. EDWARD JACKSON said that he had had an opportunity of seeing Dr. Thomson's very interesting and instructive case, which is perhaps not so far removed, however, from the more common cases of toxic amblyopia as it might at first seem. Certainly some of such cases are quite sudden in onset. Dr. Jackson has never had one that he could watch within the first week of the appearance of symptoms, but he has seen several in which there was a very definite history of quite a sudden impairment of vision, sufficient to interfere very much with ordinary occupations, and which coming under observation within two or three weeks showed the typical symptom-group of toxic amblyopia; so that while the history of this case is one of very much greater suddenness and severity than that of the ordinary case, it is a difference not radical but rather in degree.

Dr. Jackson further called attention to the fact that in some cases, particularly in a series published in the last number of the *Royal London Ophthalmic Hospital Reports* by Dr. A. H. Thompson, recovery is sometimes much delayed, although from the appearance of the optic discs there is not likely to be much improvement in this case.

In the series of cases referred to, one was under treatment for a whole year

without material improvement; yet at the end of the second year full vision had been recovered.

Dr. de Schweinitz has stated the current diverse views of the pathology of this condition. Dr. Jackson's own feeling is that if these narcotics act directly, although that is an important if, with the supposition of autoinfection that has recently been introduced, the most plausible theory is that which regards the nerve-elements as suffering first, and in some cases it would seem that the nerve-elements at the macula suffer before the macular bundle, that is that the involvement of the nerve is secondary.

DR. WILLIAM THOMSON said that he had seen this case, and had only to corroborate all that was said about it. It is of particular interest because it has been kept under observation for a longer time than is usually permitted.

DR. A. A. ESHNER asked if the patient had presented symptoms of multiple neuritis or of involvement of any other than the optic nerves. Increasing evidence tends to show that optic neuritis in its various forms, as well as inflammation of other nerves, may result in the course of any of the infectious diseases. This relation has been established in the case of malaria, of typhoid fever, of influenza and some other diseases, and it probably exists in the case of still others in which the proof is not yet at hand. It is probable that in these cases the inflammatory process, whether interstitial or parenchymatous, is actually toxic in nature. There is no reason to assume that there occurs lodgment of the causative micro-organisms in the diverse situations of the various complications, neural and otherwise. The neuritides that follow are due to the toxic influence of the products of bacterial activity, and are comparable to those dependent upon intoxication with alcohol, tobacco, lead, iodoform and other agents acting similarly.

In following the morbid process it seems scarcely necessary to interpose the action of toxins generated in the gastro-intestinal tract, with resultant auto-intoxication. It seems much easier simply to assume that under the conditions named the function of the liver is at fault, so that poisons taken in by the stomach are not restrained in their onward course or physiologically modified through the normal functional activity of the liver. As a result such poisons pass almost directly into the circulation and give rise to more or less characteristic disturbances. Just why, however, in some instances the optic nerves alone should suffer and in other instances other nerves is not yet known; and the explanation may not be looked for until more is known of physiologic chemistry, until it is known also why certain substances used medicinally act upon one portion of the nervous system and



other substances act upon other portions. The matter is one of selective affinity, and the solution of the problems attending it must await increased knowledge concerning functional, nutritive and metabolic activities of the cellular elements of the body.

DR. A. G. THOMSON said that he had not made any very careful examination of the patient as to sensation, but the man related that on recovering from his debauch his general condition was very much worse

than from the ordinary effect of alcohol. Examination of the visual field showed an increase of the scotoma outwards. Below, in that portion of the field where the scotoma was breaking through toward the periphery, vision was not as clear as elsewhere, so that, if the color-fields were large enough a scotoma for color would have been found, showing that these fibers, though not completely atrophied, were undergoing certain changes and would not receive certain vibration at the upper portion of the field.

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## HYSTERIA IN EARLY LIFE.

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AUGUSTUS A. ESHNER, M.D.

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[Read June 23, 1897.]

Through the labors of the French school of neurologists in particular, hysteria has been given the recognition it deserves as a distinct, fixed clinical entity, with a train of symptoms as characteristic as those of any of the acute specific infections or intoxications. That the disorder has a pathology of its own I have no doubt the results of future investigation will demonstrate, but as yet we need more knowledge, especially in the domain of physiologic and pathologic chemistry, before we may hope for a solution of this aspect of the problem. From both inference and analogy it seems not unreasonable to believe that hysteria depends essentially upon metabolic or nutritional changes in the cellular elements of the central nervous system, in consequence of which there may result alterations in function and changes in relation, whence arise the varied and protean symptoms of the developed disease. It may not be extravagant to hope that further refinement in staining methods, in which there has been so remarkable an advance in the past decade, may make possible the detection of changes in nerve-cells that at present elude closest scrutiny by existing means of investigation.

Though we retain the name, which perpetuates the original erroneous conception of its pathology, we have learned that hysteria may exist not only in women deprived of their uteri, but even in men as well. Hysteria respects neither sex nor

age, although by far more common in females than in males, and comparatively rare in early and in late life. The explanation of these differences must be looked for in the varying susceptibility and receptivity of the nervous system with regard to those influences to which in a general way we have learned to attribute etiologic activity. According to statistics cited by Lloyd in *A Text-Book of Nervous Diseases* (edited by Dercum), hysteria is most common in women at the age of twenty years. Briquet found one-fifth of the cases in the female sex to occur before puberty; and rather more than one-third between the ages of fifteen and twenty. Batault found the disease most frequent in men between the ages of ten and twenty. Mills, in the *Cyclopedia of Diseases of Children* (edited by Keating), reports a case of catalepsy or automatism in a girl two years old, and refers to a similar case reported by Jacobi in a child three years old. He cites also a case of hysterical paralysis in a girl eighteen months old, reported by Gillette. The evidence goes to show that hysteria, while perhaps not so uncommon in childhood as it appears to be, is yet sufficiently so to warrant the report of a small group of cases illustrating some of the phases of the disease as it appears in early life, as well as some of the difficulties and doubts that at times attend its recognition. The causes, symptoms, course and treatment of hysteria are much the same in children

as in adults, except in so far as these are influenced by modifications dependent upon differences in mental and physical growth and development.

CASE I.—N. G., a schoolgirl, nine years old, presented herself in the clinical service of Dr. Morris J. Lewis, at the Orthopedic Hospital and Infirmary for Nervous Diseases, on April 21, 1897, with the statement that about a month previously she had been much frightened by being placed by her father, who was at the time intoxicated, in a room apart from the rest of the family. The child cried and complained of feeling sick. A few hours later, during the evening, while in bed but still awake, the right hand and arm began to tremble and soon the head likewise to shake. In the course of several hours more the left hand also began to tremble. There was no convulsive movement and no loss of consciousness. The little patient now fell asleep and slept quietly through the night. On arising the next morning the movements returned, and, besides, there occurred in the lower extremities rapid movements resembling those made by a horse in trotting.

In this attack it is said that consciousness was lost, the eyes being closed and the teeth being gritted, but the tongue was not bitten. The attack lasted about five minutes, and at its close the child was quite itself again and in nowise dull. In the course of the succeeding day some ten or twelve attacks of like character took place, but sleep was undisturbed during the night.

On the following day the attacks were repeated with about the same frequency. In the next three weeks the number of attacks averaged fifteen a day, but after this it reached as high as thirty. In none had the tongue been bitten, but the mother maintained that consciousness was lost in all. Each attack was followed by headache. No attack was known to have occurred during sleep. For a week the gritting of the teeth had ceased.

A number of attacks occurred at clinic and presented the following features: While sitting, the child suddenly began to droop her head, then to move it forward and backward. Next the right hand be-

gan to tremble, and then the left. Finally the arms and legs also were set in active movement, as in the process of walking on all fours. Frothing at the mouth occurred. The eyes were closed and the child appeared unconscious. The attack terminated in clenching of the fists and tonic rigidity of the members. The mental state following was unobscured. In the intervals between attacks there was tremor of the right hand, which ceased with the onset of the attack, and also when the child's attention was diverted or engrossed, as in conversation.

The child was well nourished and of good color. Gait and station were normal; the grasp of the hands was puerile; the knee-jerks were capricious. The action of the heart was rhythmic, its sounds clear. There was no obvious derangement of tactile or painful sensibility. In the family history the only points worthy of note are the occurrence of chorea in a cousin and of rheumatism in the mother's family.

The patient herself had been born at term, had nursed at the breast for sixteen months and had been free from noteworthy illness and from convulsions during early infancy. She began to walk at the age of fifteen months, and was rather late in speaking. At the age of two she suffered from measles and at four from whooping-cough. Following the latter persistent internal strabismus had been noticed. Epistaxis had been frequent for four years, occurring mostly at night, but apparently being unattended with evil consequences. For a year the bleeding from the nose had been replaced by periodic headache, which was greatly relieved by the prescription of glasses correcting a high degree of hyperopia and astigmatism. There were no changes in the fields of vision. The child had suffered frequently from attacks of croup. She cried upon the slightest and even without any real provocation.

She was directed to take ten drops of peppermint water and the correction of the refractive error was undertaken, and she was told that if she did not speedily improve she would be placed in the hospital. The attacks at once moderated in frequency and severity, and the general condition was substantially improved.

There can, I think, be no doubt as to the hysterical nature of this case. Though lacking in some of the details of the complete clinical picture of hysteria, it yet presents so many distinctive features that mistake seems scarcely possible. The mode of onset, the character of the symptoms, the paroxysmal seizures, the emotional mobility, and finally the results of treatment, constitute such a grouping as is not encountered in any other disease. The loss of consciousness, whether merely apparent or real, while of course suggestive of epilepsy, cannot be held to exclude hysteria, as such true loss may, I believe, attend the latter as well as the former condition.

CASE II.—N. B., a girl, nine years old, came to the clinical service of Dr. Lewis at the Orthopedic Hospital and Infirmary for Nervous Diseases on April 14, 1897, with a history of several times daily for two years going through a series of peculiar movements, which consisted essentially in dropping the arms and spreading out the hands as if to catch herself in the act of falling, without loss of consciousness. She had had, besides, three convulsive seizures, in which she kicked vigorously, rolled up her eyes, etc., and in which it was thought that consciousness was lost. In some of the attacks urine was passed involuntarily, but the anal sphincter was continent and competent. In none was the tongue bitten. The child was exceedingly emotional, crying readily and being subject to attacks of causeless laughter. At times there was headache. The knee-jerks were preserved and station was steady. The dynamometric record was ten in each hand. There was no sensory derangement. The family history showed no evidence of neurotic predisposition. The little patient herself had never been seriously ill.

Under date of June 21, 1897, it is noted that the onset of the attacks followed the eating of a quart of peanuts. At that time the child had a continuous series of convulsions for two days. At present it is said that the seizures are repeated at intervals of five minutes during the day, although but one occurred during the quarter of an hour that the child was under observation, and in this, which

lasted but a few seconds, the child doubled up on its mother's lap slightly and dropped its head forward. It might have fallen had it not been supported. The attacks take place not only in the presence of others, but also when the child is alone, and she has injured herself in several. They are superinduced by the ingestion of such articles of food as meat, cabbage, tea, coffee, etc.

The child is exceedingly pallid; its digestion is poor and its bowels constipated. Pin-prick is everywhere readily appreciated. The heart is said to beat rapidly at the close of the attacks, but auscultation fails to disclose evidence of organic disease. Dr. A. G. Thomson was unable to detect any abnormality of fundus or of muscular balance. Hypnosis was attempted, but apparently without success.

While some of the features of this case are strongly suggestive of hysteria, others are not less strongly suggestive of epilepsy, and without further study the discrimination is by no means easy. I admit that the criticism may be justly made that the doubt surrounding the diagnosis should be sufficient to exclude the case from this report, but if there is no other justification for its inclusion I may be permitted to retain it in order to emphasize the difficulty with which the differentiation of the two diseases is sometimes attended, and to dwell briefly upon the fact that the same patient may be the victim of both.

This difficulty in diagnosis, and especially as it occurs in children, is illustrated by a case that came under observation only to-day in the clinical service of Dr. Lewis at the Orthopedic Hospital.

CASE III.—A nervous mother brought her little daughter of seven to learn what was the matter with her. The child was pale and illy nourished, but had no definite complaint. She had fallen about a month ago, striking her nose and suffering a copious epistaxis, which had been repeated some three weeks later. About two weeks ago the child was seized with severe headache, followed by high fever and delirium, continuing for two or three days. After the lapse of a week, the symptoms reappeared, lasting now, however, only throughout the night. Inquiry elicited

the fact that two years ago the child had suffered from "congestion of the liver," in the sequence of which she was unable to walk for a period of some weeks. Gradually, with careful training, the power of locomotion returned. There had never been a convulsion or loss of consciousness, and there was no undue laughter or weeping.

Needle-prick on the right hand was less readily appreciated than upon the left; and the point of the needle was said to be felt upon the right side of the face as a piece of hot iron. Some doubt may be felt as to the results of this sensory examination, inasmuch as the responses of the child appeared to be influenced by the tendency of the questions. However this may be, the girl submitted bravely to painful impressions capable of causing an older person to wince.

The knee-jerks were preserved; the gait was normal; the heart was rather over-acting, though entirely rhythmic, and its sounds were clear. Hypnotism was attempted, and appeared successful. At one time in the course of this procedure the child, when directed by her mother to open her eyes, maintained that she was unable to do so.

I have ventured to stamp this case with a diagnosis of hysteria, though fully alive as to its vulnerability and the possibility of deception on the part of both patient and clinician.

CASE IV.—S. H., eleven years old, was brought to the clinical service of Dr. Lewis Brinton at Howard Hospital by her mother, a music-teacher, having two other children, and herself profoundly neurasthenic, with the statement that the child was suffering from spinal trouble, which manifested itself by the appearance of a swelling at the back of the neck. The mother related that she had suffered similarly during her pregnancy with this child, and this condition in her was attributed to "falling of the womb." Both mother and child suffered from time to time from sick headache, with nausea and vomiting. The general condition of the little patient was stated to be sometimes better and sometimes worse. She was said to be quick-tempered and self-willed, and she cried and screamed at times, particu-

larly if not permitted to have her own way; although there had never been a convulsion or loss of consciousness. At times also there was undue laughter. For various reasons, but especially on account of her emotional mobility, the child had not attended school regularly. Her appetite was described as ravenous; the bowels were regular and digestion was good. When headache and nervousness were especially marked the child vomited repeatedly, but improvement ensued in the course of some hours, following the taking of food. Sleep was variable, although as a rule it was good. The knee-jerks were preserved, and common and painful sensibility appeared to be intact. The pupils were full, equal, regular and reactive to light. The action of the heart was rhythmic, its sounds clear. Hypnosis was attempted on two occasions, but without success.

I look upon this case as one of hysteria, somewhat ill defined though it be. While it presents none of the obtrusive stigmata of that disease, it is possible that time and further observation may lead to the detection of some one or another of the more characteristic phenomena. The intimate character of a disease is to be learned from a study of its anomalous as well as of its more typical forms. Neurotic parents are capable of exerting a deleterious influence upon their offspring through both heredity and association.

CASE V.—L. S., a colored girl, fourteen years old, complained of pain and soreness in the region of the stomach, which proved to be sensitive to touch. She was unable to skip and jump and play like other children on account of the resulting distress. She suffered from nausea occasionally, unattended, however, with vomiting. There was complaint of a good deal of headache, although correcting glasses were worn. There were also present tic-like movements of the eyelids. The appetite was good, the tongue coated, the bowels constipated. Menstruation had appeared for the first time some nine months previously, and, although a little irregular, was unattended with pain. During the preceding month there had been suppression of urine for three or four days on two or three occasions. The urine itself

was said to be clear and yellow. For two years the girl was subject to what were described as faints, in which she did not fall, though she seemed to lose consciousness. In these she clenched her fists, and on one or two occasions she kicked, but she had no well-defined convulsion. The duration of the attacks was said to range from five to thirty minutes. At the conclusion of the attack the child seemed exhausted and she felt drowsy. There was at no time undue laughter or causeless weeping. The attacks recurred two or three times a week, at intervals of two or three weeks. There had been a free interval of as long as three months. No definite cause could be assigned for the attacks, though they were associated in the mind of the mother with the function of menstruation, to which, however, their frequency bore no apparent relation. Nothing also was known that seemed to be capable of inhibiting or aborting the attacks. The child did fairly well at school, although apparently without ambition. There was no history of similar disease or of other form of nervous disorder in the family. The child had never suffered from any serious illness. She was considered sensitive. The knee-jerks were preserved, the patient jumping when the patellar tendon was struck and also in anticipation of a blow that was threatened but not struck. There was no gross sensory derangement. The heart displayed no abnormality. Dr. C. Y. White, by whom the patient was referred to Dr. Brinton's clinic at Howard Hospital, informed me that the patient was susceptible to hypnotism, but her failure to return prevented further study of the case.

Although I believe this case to be one of hysteria, it would appear to be the part of wisdom to withhold for the present a final diagnosis, in order that further study and perhaps personal observation of one of the attacks may yield evidence of such a character as will permit of an unequivocal and unreserved conclusion.

CASE VI.—R. F., a schoolgirl, fourteen years old, applied at the Orthopedic Hospital and Infirmary for Nervous Diseases, in the clinical service of Dr. S. Weir Mitchell, on July 3, 1896, with a history of having been frightened some eight

months before by masqueraders. She fell to the ground and was unconscious for three hours. Her jaws were locked and she breathed heavily. After consciousness returned she went to sleep and remained in bed for several days on account of weakness. Some two months later, following a recitation, the girl lay down and became unconscious and exhibited occasional twitches of the muscles. This attack lasted for three or four hours, and again several days were spent in bed. A third attack occurred after an interval of three months, without known cause. In this also the girl lay down, appeared unconscious, with her eyes open, and became rigid, but she did not bite her tongue. This attack continued for four or five days, during which the patient regained consciousness at times for periods of fifteen minutes.

At other times she appeared as if dead, being unable to see or talk. She took a little food, both liquid and solid. At the time of application the attacks recurred almost weekly, lasting three or four days at a time. The seizures were characterized by rigidity rather than active movement. After some of the earlier attacks there was inability to see, walk or talk. In some of the attacks the patient scratched herself, in some she pulled her hair, in some she kicked at those about her, and in some she made attempts to bite. In some she groaned a good deal, and in others the rectal and vesical contents were passed incontinently. Some of the attacks had occurred while the patient was alone and some at night in bed. Between the attacks she was often dull, despondent and uneasy. At times, and especially following the attacks, she cried freely and at times she laughed unduly. At times, further, she was unusually obstinate. Appetite, digestion and sleep were good, and the bowels were regular. The knee-jerks were preserved and the pupils were full, equal, regular and reactive to light. There appeared to be general diminution of sensibility to pin-prick. Of the family history it need only be said that the mother, fifty-three years old, was a nervous invalid. The patient herself had had measles and whooping-cough in childhood and from time to time suffered from bilious attacks. Menstruation appeared first

at the age of thirteen and was irregular and painful. In the inter-menstrual periods pain and swelling over the left ovarian region were complained of. Prior to the present illness there had never been a convulsion.

The hysterical nature of this case appears so obvious that further comment seems uncalled for.

CASE VII.—M. M., a schoolgirl, fourteen years old, applied at the Orthopedic Hospital and Infirmary for Nervous Diseases on September 14, 1896, in the clinical service of Dr. Wharton Sinkler, on account of a coarse, rapid tremor of the right upper extremity, most pronounced in the hand, which had made its first appearance, without known cause, a month before, ceasing after a week and being resumed after an interval of three weeks. The movement was least marked during rest and appeared to be increased on voluntary movement. It ceased during sleep. No derangement of sensibility and no limitation of the visual fields could be made out on superficial testing. The dynamometric record was 6 on the right and 23 on the left. The knee-jerks were feeble. The mother of the child was distinctly neurotic. The little patient herself had had four attacks of chorea, two involving the right side and two the left, the first at the age of six years and the last at the age of nine.

Under date of June 21, 1897, it is noted that the tremor has disappeared and reappeared thrice since the previous record. Both the girl and her mother consider her well at present, although on investigation it is found that the right hand is tremulous when extended, and inquiry reveals the fact that the shaking appears on excitement or after muscular activity, but only, or at least only in marked degree, in the right hand. There was no impairment of painful sensibility.

This case illustrates one of the forms of motor disturbance that may attend hysteria. In addition to simple tremor there may be choreoid, or tic-like movements, or spasm or convulsion, or paralysis or paresis.

CASE VIII.—In conclusion I wish to refer briefly to a rather remarkable case, in a girl of sixteen and a half years, in

whom hysterical manifestations had been present for three years or more. The patient's mother was distinctly neurotic and the father suffered probably from some organic disorder of the brain. At the age of thirteen, after some opposition, the girl fell to the ground and became rigid and blue and so remained for perhaps half an hour. Subsequently she wept. In the following year she felt certain vague sensations, with perhaps some perversion of consciousness, after witnessing an accident in the laundry in which she was at the time employed. Some months later she was found wandering about at a distance of some six miles from home, and another month later at a distance of eighteen miles or more. Menstruation set in shortly after this last escapade and recurred irregularly, with pain. At about this time the girl began to have staring attacks, which were attended with convulsive movements. In the following year she did fairly well, but at the end of this time she again walked away from home a distance of eighteen miles. About a month afterward, in conjunction with some sort of seizure from which her father suffered, the girl slept for four days, taking only liquid but no solid food. About four months later she went irresponsibly to Washington, D. C., and passed through a varied experience. Of the details of these several expeditions the girl maintained she had little or no knowledge and only faint and ill-defined recollection. She was readily susceptible to hypnotism, and while somnolent numerous facts and incidents connected with the journey to Washington and her sojourn there for several days were elicited. There was diminished sensibility to pin-prick upon face, hands and legs in irregular distribution. The pharyngeal reflex was preserved. From recent information I learn that the girl was a short time ago found under suspicious circumstances in a not entirely reputable neighborhood, and she has been since sent to a reformatory institution. At the time the patient was under my observation I could not convince myself of the entire reliability of her statements, and I am yet unable to decide to what extent she endeavored to practise simulation or deception. I was and am still inclined to believe that many of the symp-

toms have an hysterical basis, and I would be loth to deny that the several escapades were manifestations of a form of modified consciousness. In addition to the nervous disease in her own immediate family, the fact that an aunt is a mesmerist and has exercised some influence over the patient is not without interest.

I have in this communication endeavored by the report of cases to supplement what others have already done in directing general professional attention to the liability of children to suffer from hysteria, and I would further emphasize the

importance of its early recognition and intelligent treatment. I wish to reiterate the fact that hysteria may occur in either sex at any time of life. The disorder is not rarely associated with other disease of the nervous system, the existence of which would seem to predispose to the development of hysteria rather than to exclude the likelihood of its coexistence.

My thanks are due Drs. Mitchell, Sinkler, Lewis and Brinton for their kindness in permitting me to make use of their cases.

## DISCUSSION.

DR. F. SAVARY PEARCE submitted that the decision in reference to hysteria alone existing should be withheld in several of the cases, in view of the fact that longer observation might reveal true epilepsy complicated by the hysteria. Some of the cases reported as hysteria may prove to be epileptic as well. The first case Dr. Pearce had seen and he considered it one of hysterio-epilepsy from the fact that the child was unconscious in the attacks.

DR. CHARLES W. BURR said that hysteria is very infrequent in children and seldom conforms to the clinical type. Rarely is the entire picture seen—anesthesia, palsy, convulsion, and reversal of the visual fields.

In Philadelphia children at any rate, hysteria usually means a convulsive attack, an aberrant fit confined, or almost confined, to the epileptoid stage. Dr. Burr has never seen reversal of the visual fields in children and but a few times in adults and almost as often in non-hysterics as in hysterics. The most frequent manifestation of hysteria in children after convulsions is palsy or contraction of one or more extremities and that most interesting caricature of organic disease—pseudo-Pott's disease.

As to the diagnosis of the hysteric from the epileptic fit it will be agreed that sometimes it is extremely difficult to make. To diagnosticate hysteria in haste is dangerous. Certainly consciousness may be lost in hysteria, absolutely lost, and in rare cases a true epileptic fit may occur without alteration of consciousness. Again, hysteria does not vaccinate against epilepsy and both may and do occur in the same patient.

The most frequent error made in diagnosis is in confounding hysteria with pure emotionalism or downright fraud. Hysteria is too much used as an intellectual pigeon-hole for all dramatic and remarkable manifestations of disease, the clinician being

satisfied when he has given an illness a name and forgetting that hysteria has as definite a natural history as nervous syphilis or pulmonary tuberculosis. Many children will do very remarkable things and relate strange tales of suffering in order to get what they want, to be made much of, to be petted and spoilt; but this is not hysteria. It is the disease of mendacity. Again, in genuine hysteria it is sometimes difficult to separate the real from the pretended in the symptomatology. Hysteric children are often precocious, extremely susceptible to suggestion and very helpful in aiding the physician to find the symptom he is searching for. Dr. Burr has more than once examined a child for anesthesia and failed to find it until the patient discovered what was wanted.

The most difficult diagnosis probably is between organic brain-disease and hysteria. No organic disease is more likely to be accompanied by hysteria than tumor of the brain. For example, Dr. Burr is now treating a child (reported with others at the recent meeting of the American Medical Association) who may have hysteria alone or in combination with cerebellar tumor. The oculists, who usually are of great aid in such cases, in this instance have failed entirely to render assistance. They say she may have beginning papillitis or she may not. Time only will clear up the diagnosis.

DR. G. E. DE SCHWEINITZ said that he has seen several very extraordinary cases of hysteria in children—one case of pseudo-cataplexy which has been recorded by Dr. Mills in Pepper's *System of Medicine*, which occurred in a child about two and one-half years of age and followed an attack of diphtheria and diphtheric conjunctivitis. Another case, one of perfect hysterical amblyopia, with hemianesthesia, occurred in a colored child about nine years of age, whose case was studied in the Eye Dispensary of

the University Hospital many years ago. This case has already been reported to the Philadelphia Neurological Society.

In regard to the reversal of the color-fields as a symptom of hysteria it may be said that in the first place it is very difficult to satisfy oneself of the accuracy of observations with the perimeter in the examination of hysterical and nervous patients. While it is perfectly true that either by suggestion or because of retinal tire, or from other reasons not pertinent or present, but connected with what is known as adaptation of the retina, reversal of the color-fields is not infrequent, the clinician should be very slow to accept this symptom as pathognomonic of hysteria. Taken in conjunction with other symptoms, however, it is an important factor and worthy of study. In connection with optic neuritis of organic brain-disease, it is to be remembered that sometimes it is very difficult in the early stages to say whether or not a flush of the optic nerve, which is so commonly present, is the first stage of optic neuritis or whether it is non-significant of intracranial disease. In Dr. de Schweinitz' opinion statistical information would be better if the ophthalmic diagnosis in so many cases was not obscured by unnecessary technicalities. It would be better to say, for example, that the disc is flushed or congested, but that there is no actual neuritis, than to burden reports with ill-defined phraseology. That organic brain-disease may mimic hysteria is as well known as is the reverse of this statement. Dr. de Schweinitz referred to a case examined at the request of Dr. H. C. Wood, and who had all the symptoms of hysteria, and indeed Dr. Wood was inclined to consider the patient hysterical, but stated that he reserved his diagnosis until an ophthalmoscopic examination had been made. This revealed extensive optic neuritis. The patient subsequently died, and at the autopsy well-marked basilar meningitis was found; yet all the symptoms simulated hysteria. Therefore, in all of these cases ophthalmoscopic and perimetric examinations are of the utmost importance. If they are positive, their aid in diagnosis is most valuable.

DR. D. B. BIRNEY referred to the case of a baby ten months old, with a history that the mother, about three weeks after the child was born, had gone through quite a siege in nursing two other children with diphtheria, both of whom died. The mother

was nursing this little babe at the time and soon afterward she noticed that the baby apparently lost consciousness from time to time and would roll its eyes. The attacks would last only a moment and pass off. They continued thus for several months. The child when seen in one of these attacks, while apparently feeling perfectly well, lying on its mother's lap, would have a little twitching of the eyelids; then the eyes would be rolled back and lifted and rolled from side to side, with more or less twitching of the lips, slight stiffenings of one arm and leg, and perhaps in half a minute the child was apparently in a normal condition again. Bromids were given, with apparently no result. It being finally found that the mother was about three months pregnant, she was directed to wean the baby. At once the symptoms ceased and have been absent for six months.

DR. ESHNER expressed the hope that he had made it clear that the diagnosis in some of the cases reported had been made with a good deal of reservation. His endeavor in presenting the paper was, among other things, to dwell upon the difficulty at times experienced in the diagnosis of hysteria, and in children especially. The frank, open case of hysteria in either childhood or adult life is exceedingly easy of diagnosis, but in the border-line cases, in which the symptoms are ill defined, the diagnosis is sometimes exceedingly difficult. Another point to be emphasized is the occurrence of hysteria in conjunction with other diseases, nervous or otherwise. The existence of hysteria by no means excludes the existence of other disease, and vice versa. One might rather look for hysteria when other disease already exists. The symptoms of the nervous disorder will naturally vary with the education and environment of the patient.

While unwilling to call the case referred to by Dr. Birney one of hysteria, Dr. Eshner would be likewise unwilling to call it one of epilepsy. One not rarely sees in children cases of sudden transient rigidity without other attendant phenomena. In these one may expect investigation to disclose some derangement of nutrition on the part of the child, giving rise to cerebral irritation, as manifested by these periodic, brief attacks. Such a suspicion receives support in Dr. Birney's case from the statement that the attacks ceased with the weaning of the little patient.



## SOME OF THE CAUSES DEFEATING THE PROPER PROGRESS OF THERAPEUTICS.

HENRY BEATES, M.D.

[Read June 23, 1897.]

In the consideration of this subject, the question naturally arises as to whether or not there is a progress in therapeutics which, when compared with the advance in other departments of our art and science can properly be considered commensurate. The answer to such an inquiry can be most briefly and positively stated, and, with regret, is formulated in the negative, by a perusal of the latest standard works of reference. With few exceptions those diseases with which we are most frequently confronted, and which comprise the most common or prevalent, compel the realization of the fact that therapeutics cannot lay claim to much, when viewed from the standpoint of the physiologist, pathologist and surgeon.

Let us consider such a frequently encountered affection as acute croupous or lobar pneumonia. Its treatment to-day is still argued as it was decades ago, and the pages of volumes of reference, as well as the fiat from the professorial desk, teem with interrogations that should long ago have been definitely and positively settled, had the same careful and analytic study been instituted that characterizes research in other channels. Etiologically the almost exclusively mechanical interpretation of the circulatory function of the affected pulmonary lobe, if this is the only area diseased, which is submitted as an explanation for that peculiar exudate which it may here be remarked could not be caused by any interference, purely mechanical, with the venous or arterial side *in loco*—still obtains, and the advocates and adversaries of phlebotomy and the champions of aconite, tartar-emetie and veratrum viride all have disciples, who find the subject as completely unsolved by the tests of practice as it was a century ago. The average mortality of twenty-

eight per cent., now as then, substantiates the fact that in this disease therapeutics has not progressed.

Why, in the light of the facts, are these incomplete teachings still perpetuated? The great frequency of this disease and the opportunities offered for lines of thought and investigation in channels dissociated from the traditional beliefs, when still surrounded by this curculatory infatuation, in spite of its almost incessantly demonstrated uselessness, should, at least, direct attention to the study of its treatment upon an entirely different basis. If there is one fact established about pneumonia, it certainly is that it is not, *per se*, an inflammation of the lung. It is unquestionably an expression of a trophic derangement, followed, it is true, secondarily, by inflammatory phenomena, and why therefore the early treatment should still center about the antiphlogistic notion is a question that can fittingly be propounded.

Syphilis will also serve as an illustration; its natural history, so to speak, affords a clinical picture so distinct that, even though its *materies morbi* is still in doubt, the ultimate outcome is comparatively easily prognosticated, and yet its therapeutics is still debated around the mercurial and non-mercurial methods and such sub-divisions thereof as the interrupted and continuous, mixed, and several other useless combinations and modifications, which, when carefully followed as to their results, disclose negatives that should long ago have relegated them to the oblivion they so well deserve. There is scarcely any affection which, if skilfully treated according to the rules that should be determined by the conditions obtaining in the individual sufferer, offers such promise of relief as this disease, and when

the notions that are formulated in the terms already indicated will have been abandoned and a proper advance made in its therapeutics, the *psoriasis lingualis syphilitica* and other commonly seen lesions of the mucous membranes will cease to be so frequent in cases that have been discharged as cured but improperly treated as the result of these modified plans.

Pertussis, notwithstanding our ignorance of Afanassiew's bacillus, has recommended for its treatment in the latest works issued by a prolific medical press, a host of pharmaceutic preparations, the trial of which long ago incontestably proved their impotence, and yet there is perpetuated, to the discredit of the most important department of our profession, such teaching.

If the treatment of the acute inflammatory troubles most commonly met is examined, what do we find? In simple acute laryngitis, quinin is advised in quantities for which a caution is deemed necessary in order not to add to the existing trouble aural and cerebral difficulties that would be decidedly worse than the affection to be treated. Are such absurdities unusual? Unfortunately they can be enumerated for too many diseases that long, ere this, should have ceased to be so managed.

As to the therapeutics of simple acute pleurisy, it suffices to point to the many instances of irreparably disabled victims, whose health has been damaged by a serious deformity resulting from changes of structure requiring an ultimate resort to surgery, necessitated by the consequences of a plan of treatment which advance in bacteriology and pathology has demonstrated to be no longer valid; and to rely upon applications, and the exhibition of absorbents which, over and over again have been proved to be almost useless, until an innocuous transudation has become the seat of retrograde changes, resulting in the development of a focus for infection and destruction, does not contribute to the dignity of clinical medicine.

Well may the injunction, intimated in one of our most recent and reliable works of reference, be seriously contemplated, with a view of establishing treatment at least different from that which has and still prevails. "The *vis medicatrix naturae* is probably the chief remedial agent in

many cases, non-rheumatic, in which (latter) cure takes place under the use of the salicylic compounds, potassium iodid or other specific drugs." It is better oft-times to do nothing, in so far as remedial agents are concerned, than to institute procedures about which if anything is known, the least and most that can be said is that no appreciable effects have been secured. To apparently be doing something and having as a result nothing lends to nothing a dignity and value dangerous to the integrity of the profession.

It is needless to further consume time with additional illustrations, and attention is directed to some of the causes operative in the maintenance of the situation just depicted. The most important factor doubtless is a lack of knowledge on the part of the profession of the natural course and termination of disease. Very meager are the published facts governing this important theme, and teaching is conspicuous for the absence thereof, and consequently the clinician, no matter what plan of treatment is instituted, is incapable of recognizing whether or not morbid processes have been modified beneficially or injuriously.

Reflection upon this fact discovers much to account for the perpetuation of relatively valueless therapeutics. Dependence upon the goddess of fortune too commonly pacifies conscience and engenders a habit of thought and procedure pernicious to therapeutic progress. To such, at the bedside, the exhibition of almost anything, alone or in complex combination, suffices, so long as the patient continues to improve, and when this does not take place there is a consultation or a change of physicians resulting in a resort to some ridiculous "pathy," and such careless and defective therapeutics is crowned with a result just as good, or, more correctly speaking, just as bad from the one plan as the other.

Another cause is our *materia medica*. Why the brain of a student must be engaged, at the expense of energy and time that should be occupied in the acquisition of more valuable knowledge, in memorizing the name, habitat, natural order, preparations and doses of a lot of obsolete and useless drugs is a question not inopportune. Such substances as *castoreum*, *cam-*

phoric acid, lactucarium, veratria, urethan, oxalic acid, geranium and an array of innumerable and superfluous preparations of even our standard drugs, should be relegated to regions remote and not be a cause for an anxiety in the green room, which, unfortunately, does not end there, but is in danger of inculcating a lack of confidence in medicines of value and unquestioned merit, frequently reaching far into later life.

Associated herewith is the congener pharmacy. The classification of drugs is based upon their especial and intrinsic or inherent properties, and as many are derived from the vegetable kingdom, and according to conditions there existing, they must of necessity be characterized by complexity of composition. Several active principles are contained in one crude drug, and according to the solubility of these in the medium employed in pharmacy do tinctures, infusions, decoctions, extracts alcoholic and aqueous, and the drug itself represent remedial agents from which it is impossible to obtain uniform, definite or specific results, and to look under these conditions for achievements in therapeutics which should be distinct and unmistakable is unreasonable.

Again, even the chief active principle, or that which classifies a drug, is present in such a varying percentage that it is impossible to prescribe any of these preparations, from this or that pharmacy, with precision and accuracy. Among several remedies, I have investigated the tincture and fluid and solid extracts of aconite root, and repeatedly found such variation in therapeutic power as to render it impossible to regulate the dose with the hope of securing anything like definite results. One tincture, by carefully graded increasing quantities was found to be inert so far as physiologic phenomena were concerned until administered in doses of one fluidram. Is it any wonder, then, that these conditions, which obtain alike for *all* drugs thus derived, result in the abandonment of many most valuable remedies, and a consequent misinterpretation, not only of the virtue of remedial agents, but also of the modification of the natural course of disease, and consequently of therapeutics.

Our preparations should be assayed not chemically only, but both chemically and

physiologically, for to secure a uniform standard of strength for organic alkaloidal derivatives by chemistry alone is, for obvious reasons, impracticable; hence the necessity for the physiologic. Another point, in a sense foreign to the profession, but no small factor in obstructing progress, is the unreliable pharmacist, but as this is somewhat beyond the subject-matter of these remarks, it will be dismissed with a passing notice.

Thus obtain conditions within our province to correct, which determine the existence of a now well-established custom, alike destructive to the integrity of clinical medicine, therapeutic progress and the art and science of pharmacy. Judging from the enormous manufacture and consumption of the many varieties of foods and the falsely designated diastasic products, the inference is fair that too commonly does the profession seek guidance for therapeutics from the pamphlet literature of this modern but evil institution. A diagrammatic illustration of an alleged microscopic field exactly demonstrates how a red blood-corpuscle opens its receptive channels at once to the chalybeate which, manufactured here or there, is dubbed a knight of peculiar and mysterious power.

Again, our trusted friend, cod-liver oil, which we know effects its truly beneficial influence upon metabolism when administered complete, is presented to us in such fragmentary and associated conditions, each one of which, according to this class of literature, is said to embody the virtues of its entirety as to largely result in the defeat of its purpose; and what has been said of this is applicable equally to many more of our medicines. The avidity with which the clinician grasps this is another illustration of an obstructive factor already mentioned.

The compressed disc is another evil and should be accorded a place befitting its true value. That such products render impracticable proper dosage and combination, and therefore defeat skilful and effective therapeutics, is obvious. A sadder sight, conspicuously sitting as judge over such customs cannot well be conjectured than that of the slowly and struggling convalescent being improperly nourished by one of these many products composed of cheap whisky, well diluted, mingled

perhaps with a pretence of some proteid element and flavored with an essential oil and licorice; and yet it constitutes a type of that degenerate therapeutics which already has in a great measure supplanted

the legitimate and taken the place of that well-trained, skilful and scientific practice that should be the purpose and highest achievement of the profession.

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## DISCUSSION.

DR. JAMES TYSON said that Dr. Beates had taken up most of the weak points in the progress of therapeutics, and had told the

exact truth of very much, and he thought that the members of the Society would sustain him in most if not all he had said.

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## A SERIES OF ABDOMINAL SECTIONS.

JOSEPH PRICE, M.D.

[Read September 8, 1897.]

I should hesitate to present a group of specimens from my own operating table if I did not feel that they had an educational value. That is their only value, presenting to the eye as they do the conditions for which the respective operations were done. They demonstrate and teach practically, and very generally give rise to interesting and instructive discussions. We speak better from our own experience, our own observations, our own operating tables, than from any other standpoint. We speak better from that standpoint than from any other for the reason that the lessons we practice in our work are those of our experience and observation. They have been gained by very many leanings over a table. We speak more practically, less theoretically. There is less hypothesis and more fact.

I cannot do better than call attention to the mixed nature of intra-peritoneal and intra-pelvic troubles and the serious pathologic sequelæ incident to their development. The simple removal of a growth is common and easy—and the least part of the surgery. The real surgery, the test of patient skill, comes in when adhesions, twists and distortions of the viscera are to be corrected and pathologic lesions of important viscera to be cleaned, trimmed and repaired. These are commonly the most important steps in abdominal operations.

In this connection I shall cite one or more cases, and exhibit specimens. This large tumor filled the entire abdominal cavity. Its pedicle was small and easily managed. But the upper portion of the large mass was firmly adherent to the transverse meso-colon or was completely imbedded in it. The freeing of the colon required a careful repair of its mesentery, as well as of portions of the large bowel. In from six to ten per cent. of the cases of tubal and ovarian disease it is necessary to remove the appendix, repair the head of the cecum, free the adherent ileum and resect or repair its lesions. Sometimes the adhesions vary from a few inches to two or three feet in extent. Again in puriform disease of tubes and ovaries lesions of the rectum and sigmoid are quite common. Inspection and repair are vital, and if carefully effected the lesions heal kindly and quickly, and there will be an avoidance of many of such uncomfortable post-operative complications as fecal fistula, sinuses, post-operative adhesions and the generally tedious convalescence associated with the method of dealing with such cases without repair. The great number of men who do, or attempt to do, abdominal work and refuse or hesitate to repair carefully visceral lesions, is simply surprising. Really this is one of the most important features of the work. A number of deaths are largely due to the simple

removal of the growth and doing nothing more. The adhesions and kinks of the bowel favor early distention and obstruction, with nausea and vomiting, which then occur, usually on about the third day. Such complications as these are always favored by the failure to employ drainage.

The practice of employing drainage, carefully placed and well cared for, never fails to give the best results. While condemning drainage by the supra-pubic route many surgeons have tried the lower route in connection with which about all the methods are imperfect, incomplete, and fail to effect cures. There is marked inconsistency in the teaching of such men to drain after every operation and by all known methods. It is curious that they should contradict the value of drainage in supra-pubic work when they rely so absolutely upon it when operating from below. Drainage has served a great purpose in establishing a variety of operations, thus relieving a variety of pathologic conditions. This fact is forcefully illustrated by this interesting and instructive group of specimens. Yet specimens and illustrations give no fair or adequate idea of the enormous extent of adhesions dealt with—nor of the numerous sutures used in the repair of bladder or large and small bowel in any given case. In a few cases resections were necessary for disorganization due to suppuration or malignant disease. In three cases I resected the large bowel; all the patients recovered. The specimen of cecum and ileum is of sufficient importance and interest to justify a special report and discussion. There is much fine surgery done at present—but it remains important that the refined principles and practices of the successful surgeon should be promulgated by papers and discussions in our societies.

Practical discussions are of immense value to the general practitioner and to those especially who by reason of locality are without the advantage of society meetings and the clinical object-lessons there given, and of the lessons conveyed to those witnessing such operations as are illustrated by the group of specimens here presented. I find that the man who leaves his home and work for a few weeks to witness operations at the table is a thrice more useful and important man in his community after his return. Before leaving home

the probability is that he never saw, to clearly recognize or diagnosticate, suppurating appendages, ruptured tubal pregnancy, appendicitis or virulent troubles such as suppurating dermoids, twisted pedicles of cystomata in his town or community, but when he gets home he finds them in large numbers, and he commonly becomes a specialist.

Much of this work is done at the homes of the patients. In clean homes, with clean environment, I am satisfied results are the best, better than those in hospitals—where there is always an element of contamination. The admission of patients suffering from carcinoma is contaminating in private and public hospitals. Work, to be successful, must be free of filth. All large cities and States should have a hospital for cases of carcinoma. Puerperal sepsis is especially virulent. Four times I have been poisoned and made very ill from operations for acute post-puerperal suppurative peritonitis—the patients all recovering. We scarcely have a stitch-hole abscess or a coated tongue when the hospital is free from cases of carcinoma and septic patients.

As yet we have not succeeded in educating the profession in the importance of early interference in all intra-pelvic and peritoneal disease. In and about this city tapping cystomata is a common practice. The subjects of many of these operations are greatly emaciated and many feeble beyond locomotion. They are carried into the hospitals on arms or on stretchers and some are too ill for transportation. In my own work the mortality has been low. I have lost four cases in a large series of mixed operations. The specimens are not all here.

Early diagnosis leads to early surgical interference. The pus-cases, ectopic pregnancies, appendicitis and twisted pedicle all belong to the important group requiring the earliest possible interference. The diagnosis made, there is but one treatment. Every careful clinician should have experienced assistance and counsel when he has even a suspicion of any of these troubles—and should not make the choice and accept the opinion of one who commonly says: "We will see when we get in."

Mrs. M., aged 40 years, had an ectopic pregnancy on the left side. Rupture took place about a month before the patient

came under observation. The omentum was firmly adherent to uterus and bladder and beneath it sigmoid and ileum were also adherent to uterus and bladder. The operation included freeing of all adhesions, and enucleation of the sac filling the pelvic basin. The tissues were friable and disorganized. Drainage was provided for.

Miss J. H., aged 18, had a double pyosalpinx, with adhesions of omentum and bowel. Twelve inches of the ileum were strongly adherent and repair was necessary. Clean removal of both sides was effected, the tubes being cut out of the uterus.

Miss M. C., aged 38, had supra-vaginal hysterectomy performed by the Koeberle method. The uterus was large and symmetric but free from fibroid nodules. The appendages were healthy. The tumor was muscular in appearance and situated within the uterus. There was a history of rapid growth. There were no adhesions and the operation was simple.

Mrs. L. N., aged 35, had an extra-uterine pregnancy on the left side. The abdomen was filled with blood, rupture having taken place five days before the operation. The patient had the common history of recurring paroxysms of pain, was blanched, and her whole appearance was that of one bleeding. She had been nursing an infant. Ectopic pregnancy has occurred during lactation six or more times during my experience. The symptoms have always been alarming. Prolonged lactation seems to favor extra-uterine pregnancy. The patient had been sterile since the birth of a child or the occurrence of a miscarriage, six or ten years ago. This was followed by a history of some pelvic mischief. There had been a delayed period or absence of one or two periods. Then there occurred sudden, severe pelvic pain, with the usual symptoms of loss of blood or concealed hemorrhage. The doubtful abortion was followed by a prolonged bloody discharge, commonly lasting two or more weeks. This is a common history. The objective signs are easily recognized, the uterus being enlarged and pushed to one side by a boggy mass. This is extremely tender, and commonly unilateral. Occasionally the boggy mass is absent. There is only little clot, but an enormous quantity of

blood is present. There are further central distention of the abdomen and marked tenderness. The nervous symptoms are interesting and of value in diagnosis.

Mrs. K. M., aged 35, had a multi-nodular fibroid of the uterus, with right hydrosalpinx. The left tube and ovary were healthy. There was a history of doubtful miscarriage years ago and symptoms of tubal disease of long standing. There had been rapid growth of the fibroid in the last six months. Extra-peritoneal hysterectomy was performed.

Mrs. K. H., aged 27, married four years, had no children, but complained of pelvic pain since July, which confined her to bed. Operation was performed for ruptured tubal pregnancy on the left side, drainage being provided for.

Mrs. S. R., aged 47, had an intra-uterine malignant growth and had submitted to repeated curetments by other attendants. Vaginal hysterectomy was performed with the aid of clamps.

Mrs. S., suffered from complete procidentia, bladder and bowel being prolapsed. A growth had formed upon the posterior lip of the cervix. Vaginal hysterectomy was performed with the aid of the clamp and recovery ensued.

Miss A., a colored woman, had borne no children, and presented a multi-nodular fibroid, which had been recognized some years before. There were found numerous small masses completely filling the peritoneal cavity. Adhesions were general to the viscera and the loins. The appendages were occluded and fixed. Clean extirpation was practised and drainage provided for. Recovery took place.

*Typical case of Tubal and Ovarian Abscess.*—A married white woman had double pyosalpinx, double ovarian abscess, with leaking into the peritoneal cavity. Clean enucleation was effected; irrigation practised, and drainage provided for. Recovery took place.

Mrs. G., aged 46, had double pyosalpinx and general adhesions. The right tube was enormous. Section was performed, with clean removal of both sides. Irrigation was practised and glass drainage employed. Recovery took place. This case illustrates

beautifully how some pus-tubes can be enucleated without leakage.

Mrs. M. G., aged 24 years, had borne one child, and had double pyosalpinx and double ovarian abscess. There were universal omental and intestinal adhesions. Section was performed and all these were freed. Both tubes and ovaries were removed. Irrigation was practised and glass drainage provided. Recovery ensued.

*Concretion of the Appendix.*—Master —, aged 9 years, was subjected to extirpation of the appendix and freeing of adhesions. The peritoneal cavity was washed, its toilet made, and drainage provided for. Rapid recovery followed.

Mrs. B., aged 30, had borne one child, and had had one miscarriage. Perforating ulcers of the ileum were found. The small bowel was generally and strongly adherent. There was a large puddle of pus in front of and posterior to the left broad ligament. The ileum was freed throughout and 30 inches of disorganized bowel resected. A Murphy button was employed. A dirty pus-sac on the left was curetted. Free irrigation was practised and gauze and glass drainage employed. The patient died. She was dying when she entered the hospital, and had been ill for three weeks.

Miss — had never been pregnant, and presented a sarcomatous tumor of the right vaginal vault. Extirpation of uterus and tumor was effected by means of forceps and ligature. The hemorrhage was very free and difficult to control. Recovery took place.

Mrs. — had borne three children, and had been ill for many months. She was feeble and emaciated and had a high temperature. There was constant abdominal distention. Tubes and ovaries were fixed by disease. There were occluded appendages, with retention. The disturbance of the bowel had been primarily overlooked, but after the section the patient did well for two weeks, when symptoms of perforation occurred, and lasted for a week. The patient died on the twenty-first day. I did not see this patient after the operation.

Mrs. S., aged 46, had borne no children, and had had no miscarriage. She presented

a large edematous myoma, studded with small fibroid nodules. The appendages appeared healthy. Supra-vaginal extra-peritoneal hysterectomy was performed with the aid of the Koeberle *noeud*. The incisions over this tumor show how the tumor was deperitoneized to make the pedicle. Recovery took place.

Miss Z. L., age 40, presented a multi-nodular fibroid, with a pus-tube and an ovarian abscess on the right. Supra-vaginal extra-peritoneal hysterectomy was performed with the aid of the Koeberle *noeud*. Recovery ensued. Nine or ten years ago I removed a suppurating dermoid from the left side of this patient, with a general suppurating peritonitis. All intestinal adhesions were freed at that time and remained free after irrigation and drainage.

Mrs. H., aged 55, had borne six children and had had one miscarriage. There was found a multi-nodular fibroid the size of an adult head. Intra-uterine malignant disease was also present, together with a small malignant tumor of the right ovary, the size of an orange. There was, besides, a large umbilical hernia, full of omentum and small viscera. Section was performed and total extirpation practised. The hernia was closed. The incision in this case extended from the ensiform cartilage to the pubes. Recovery took place. There was really too much surgery required for one operation, as dissection of a huge ventral hernia was necessary to the hollow of the sacrum for the removal of the fixed diseased tubes and ovaries.

Mrs. F., aged 38, had a multi-nodular fibroid of the uterus with suppurating appendages and universal pelvic fixation. A clean extirpation was effected. Recovery ensued. Two weeks before the operation this woman had had an angry peritonitis. A good operator saw her in consultation, and thought her condition unpromising for operative interference. Ten years ago I had enucleated a large ovarian abscess from the left side. The patient was then septic and very ill. A fecal fistula followed the toilet and drainage, but rapidly closed. The last operation, four weeks ago, was an exceedingly complicated one. The enucleation was difficult, as the fibroid and the diseased appendages filled the entire pelvis. Intestinal adhesions

were general and required repair. In short a resection seemed indicated. Irrigation was practised and drainage provided for.

Mrs. K. McG., aged 38, has had no children. She presented a dermoid cyst on the left side. The uterus was studded with small fibroids. Section was performed, with the removal of the cyst and also of the right tube and ovary. Recovery took place.

Mrs. C., aged 27, has borne one child. An extra-uterine pregnancy was found occupying the left tube, with general adhesions of omentum and bowel. Section was performed and the omentum freed. The sigmoid was folded over the distended tube and freed. The left tube was repaired. Irrigation was practised and glass drainage provided. Recovery took place.

Mrs. H., aged 30, has borne no children. A vaginal incision had been made, puncturing into the right broad ligament for ectopic pregnancy. A left pus-tube was generally adherent. A right tube and a disorganized ovarian abscess were present, together with firm, deep, general adhesions. Enucleation of the punctured side was very difficult. Cecum and ileum were adherent to the diseased ovary on the right side. There were firm omental adhesions. Section was performed and omental and intestinal adhesions all freed. Extensive stitching of the bowel was required. Removal of both appendages was effected; irrigation practised; and the Koeberle *noeud* was employed. Recovery ensued.

Miss —, a school-teacher, presented a large myofibroma, with free, irregular bleeding and pressure-symptoms. The incision from tube to tube on the anterior aspect of the tumor and the deperitoneization of the tumor show in this case very beautifully how the broad ligaments are carried up and over such growths. The sinuses in this case were as large as fingers on both sides. In this operation a Koeberle *noeud* was employed. Recovery ensued.

Mrs. S., aged 34, had borne one child and had had one miscarriage. An operation for ectopic pregnancy had been performed five years ago. A large multilocular cyst was found extending to the umbilicus, and deep into the pelvis. There were universal and pelvic adhesions. The sigmoid was attached to the posterior wall of the cyst for twelve inches. The bowel was opened in the course of the enucleation and both ureters were exposed. The left ureter was dissected out of the left wall of the cyst. The iliac vessels were laid bare. The cyst was enucleated and the sigmoid repaired. Irrigation was practised and drainage provided for. General malignant invasion had, however, taken place in the surrounding viscera.

Mrs. M., aged 20, had had one miscarriage. She presented double pus-tubes and an ovarian abscess. There were general and dense adhesions. Section was performed and removal of both tubes and ovaries effected. All adhesions were freed. Glass drainage was employed. Recovery ensued.

## DISCUSSION.

DR. A. F. MULLER said that the one specimen in particular referred to was removed from a young unmarried girl, about 20 years old. She had had an attack of appendicitis some five months before, from which she recovered in about two months. Dr. Müller was sent for in a great hurry, but he could not respond at once, being occupied with a case of labor. When the patient was seen there was found an exquisitely tender abdomen, with a tumor that was thought to be fluctuating, but as to this there was no certainty because there was so much pain that palpation could not be practised properly. With the knowledge of a previous attack of appendicitis in mind, the pa-

tient was purged with Rochelle salt and calomel. By the next morning the tumor had increased very much in size, and by a rectal examination the os was felt very plainly through the rectum, the fundus pushed back in the hollow of the sacrum, with the tumor behind the symphysis between uterus and bladder, and evidently fluctuating. The patient was advised to enter a hospital, and was operated upon on the same day. She had had much pain and sick stomach, and had vomited up to the morning of the day of operation, when the nausea and vomiting ceased. When the abdomen was opened the twist in the pedicle was very plainly seen. There was a double



twist, occluding entirely the veins, while the artery was still pumping blood into the ovary and distending it to that extent. The ovary has shrunk since its removal, but it holds its color fairly well. The woman is doing perfectly well, and has not had a bad symptom.

DR. L. J. HAMMOND made inquiry as to the percentage of the cases operated on by Dr. Price, and if there had been a recurrence of malignant disease. His experience, while not so large as Dr. Price's, has been very encouraging, inasmuch as in but one case was there no recurrence, and his feeling is that malignant disease of the uterus, as well as the breast, invariably recurs. The great inability to recurrence was evidently the experience also of Dr. Agnew, who was accustomed to say that in any case diagnosed as disease of the breast in which recurrence did not take place within two years, he felt disposed to consider that a mistake in diagnosis had been made. Dr. Hammond referred to the case of a woman whose breast was removed for malignant disease eighteen months ago, microscopic examination confirming the clinical diagnosis, and who is still perfectly well. He asked further, how long the cases requiring bowel-resection, spoken of by Dr. Price, remain free from signs of malignancy?

DR. W. S. STEWART emphasized the point made of malignant disease returning in any part of the body from which a malignant growth has been removed.

DR. EDWARD JACKSON asked in reference to the color of the specimens, whether formaldehyd had been used for purposes of preservation. In ophthalmic work this substance has proved to be the best hardening agent at hand for rapidity of action, and for preserving transparency and color, if not used in too strong solution. Some of the early accounts of formaldehyd spoke of its superiority for preserving large specimens, and in ophthalmic work it is used to preserve the eye-ball entire without opening it, as is necessary with other hardening agents.

DR. MÜLLER said that his specimen had been preserved in about 33 per cent. wood alcohol. The specimen was two and a half weeks old, and had retained its color very well. It had not coagulated at all.

DR. JOSEPH PRICE said that the case reported by Dr. Müller is typical of a common accident torsion of the pedicle. Women in whom this occurs have an acute peritonitis. Dr. Müller simply washed out lymph and picked out lymph in big pieces, and he had in this case a typical septic peritonitis. He irrigated with boiled water and drained, and the patient has not had a bad symptom.

In the Woman's Hospital in the city of New York, three years ago, some remark

was made about abdominal work, and Emmet said if he had his life to live over again he would devote it to the treatment of malignant disease. He narrated the case of a wealthy woman from whom he had extirpated the uterus four or five years before, and she was still living and active in society. Two or three years later this woman was still living.

Dr. Price said that what Dr. Hammond had said of his experience is true of his own, as he has never known malignant disease not to return. He credited Gibson with the statement that removable malignant growths will return; while if there be an error in diagnosis there will be no return. Dr. Price some years ago removed both breasts from a woman, leaving a little island of skin on her sternum, and cleaned both axillæ. The operation was performed early in the history of Listerian methods, mercurial solution being employed upon one side and the other being irrigated with pure hot water. The latter showed the cleanest incision and the dryest and most perfect wound. The woman went to another city. Eleven years later she was reported to be in good health, but a year ago Dr. Price learned that subsequently the uterus had been removed for carcinoma and death took place. In that case there had been no return of the malignant disease about the chest, but in Dr. Price's experience recurrence has taken place in every case of uterine carcinoma.

In cases of malignant disease of the bowel the interval is much longer. In cases of hour-glass contraction due to epitheliomata, the obstruction involving small or large bowel, if the extirpation is a generous one, taking in four or six inches, recurrence is far off. Some cases now living and in good health were operated on four or six years ago. Recurrence always takes place in cases of involvement of the breast. When recurrence takes place the patient is likely to consult another surgeon than the one who operated in the first instance.

As an evidence that recurrence does not invariably take place, Dr. Price referred to the case of a woman in the practice of the late Dr. D. Hayes Agnew, from whom one breast was removed 12 or 14 years ago for malignant disease. The patient presented herself to Dr. Price with a huge fibroid a few months ago, with no evidence whatever of recurrence in the chest. Probably there was an error in the diagnosis of the character of the tumor. In his own practice recurrence takes place in all the unmistakable cases of malignant disease. Dr. Price referred to the case of a woman who had a tumor of her breast with characteristic symptoms of malignancy, which was removed some nine or ten years ago. The patient is still well and active, and with no evidence of recurrence. The cases of non-recurrence must be looked upon as mistakes in diagnosis.

## THE SURGICAL TREATMENT OF GOITER.

EDWARD MARTIN, M.D.

[Read September 22, 1897.]

I beg to exhibit six patients on whom I have operated and a seventh who was apparently cured or at least relieved of all her general symptoms as a result of evacuation of an abscess that formed spontaneously.

Three of the cases occurred in sisters aged 33, 31 and 29 years, respectively. There was no other goiter in the family. The patients are of Scotch-Irish-Welch extraction and came from a region in which goiter is practically unknown. They all noted from childhood a peculiar shape of the neck. In two a distinct lump developed at about the tenth year; in the third no growth was noticeable until the period of gestation. The goiter was parenchymatous in two of the sisters, cystic in the third.

The fourth case was a native of Austria; 33 years old, who came from a region in which goiter was common. No member of her family is similarly afflicted. She noticed her neck to be peculiarly shaped when a schoolgirl. A lump developed when she was carrying her first child.

The fifth case, without a goitrous history in the family, was in a woman, aged 33, who noted the development of a tumor in the neck when 21 years old. This grew with special rapidity during the period of gestation.

The sixth case was in a man, aged 30, of Irish parentage. There was no history of goiter in the family. He first noticed a lump in the neck when he was twenty years old. Shortly before operation he became involved in a fight and was seized by the neck. As a result the tumor swelled greatly and became extremely painful.

The seventh case, in which cure followed suppuration, occurred in a woman aged 33, with no goiter in the family history. The tumor was four years old. Without cause it swelled rapidly, became extremely painful and hot, and symptoms of septic absorption developed. Incision

evacuated a half pint of pus and broken-down blood-clots.

With one exception, all these patients suffered from headache, more or less sleeplessness, recurring distressing attacks of cardiac palpitation and shortness of breath. In two, there was slight exophthalmos. In all but one, symptoms of neurasthenia were pronounced. A transverse curved incision, with its convexity downwards, was made in each case. In one enucleation was attempted and was accompanied by violent and life-threatening hemorrhage. Previous ligation of the vessels would have made this operation a perfectly safe one. The patient, however, convalesced promptly. In two cases paroxysmal seizures occurred 24 hours after the operation. In the remainder the convalescence was uninterrupted. In all there was much oozing, necessitating a change of dressing within the first twelve hours. This took place from the cut surface of the thyroid, was venous and was due to the congestion incident to vomiting, following ether-narcosis. In three of the cases the wound was closed without drainage; in the remainder the wound was drained in order to provide for this oozing. In all but two of the cases the percutaneous suture was used. The interval following the operation varied from eighteen months to two years. The patients are all well and the scar in every instance is insignificant; in two cases it is scarcely visible. In addition to the relief of the very great deformity, the nervous symptoms have entirely disappeared, with one exception.

The operation performed was, with the exception of enucleation in one case, practically that commended by Kocher. The transverse incision is perfect, as it gives free access to the operative area. Apposition of the margins of the wound is more accurately effected by suturing, and after healing a much less conspicuous scar is left. This incision was carried over the most prominent part of the goiter,

from about the mid-width near the sterno-cleido muscle, to a similar point on the opposite side of the neck. When the goiter is very large the angular incision is to be preferred. This begins over the bulge of the sterno-mastoid muscle at the level of the thyroid cartilage and runs transversely in the direction of the wrinkles to the middle line of the neck, then downward to the suprasternal notch or the middle of the manubrium. After division of the skin the fascia uniting the sterno-hyoid and sterno-thyroid muscles on each side is divided and these muscles either retracted or cut across. The sterno-mastoid muscles are then well retracted and the fibrous capsule investing the goiter is cut through until the surface of the tumor is reached. This presents a typical brownish or bluish color and often has ramifying over its surface enormous veins. By means of the fingers and gauze sponges the fibrous capsule is separated from one lobe of the tumor, the veins being ligated as they are encountered. This lobe can be lifted upward and forward, exposing its posterior surface. By this means isolation of the thyroid artery and vein is possible, with the application of ligatures to these structures. The upper or the lower portion of the lobe is now turned out, accordingly as the one or the other is the more readily freed from its usually slight adhesions, and the vessels are secured by ligatures. A stout ligature is then passed beneath the isthmus, and the tumor is either removed completely, provided the other lobe of the thyroid be healthy, or is split and from its substance cysts and nodules are enucleated. Traction upon the isthmus or tightening the ligature readily controls bleeding. Freeing the goiter from its capsule is greatly facilitated by dry gauze sponging, the upper cornua of the tumors being turned out first, and the superior laryngeal vessels ligated. The main operative difficulty is in overcoming adhesions posteriorly. In one case these fixed the tumor to the deep cervical fascia covering the pre-vertebral muscles. Care was taken to thoroughly isolate the inferior thyroid arteries before ligating them, lest the recurrent laryngeal nerve should be injured. When the portion of the thyroid lying in relation to this nerve seemed healthy, it was cut across and left in place,

thus effectually guarding against injury of the nerve. Care was taken to secure each bleeding point before proceeding further with stripping of the capsule. The amount of blood lost was extremely slight. In all cases a portion of gland was left equal in amount to at least two-thirds of the bulk of the normal thyroid. In one instance more than this was left, and this is the only case in which the nervous phenomena were not promptly relieved. One case had been subjected to three months' treatment with electricity applied by an expert. This was without avail, but the scars resulting from the treatment are, even now, more conspicuous and disfiguring than that which shows the position of the transverse incision for removal.

As the object of this communication is to show the results of operation in the patients who have presented themselves, a discussion of the pathology of the disease is unnecessary.

Clinically, goiter can be classed under three general headings:

1. Tumors, either smooth or large, solid or cystic, which occasion neither local nor general symptoms and are annoying only because of the deformity they cause.

2. Tumors which by mechanical pressure on important structures cause pronounced local symptoms. Chief of these are pain, tenderness, distinct alteration of voice and cephalic congestion. The local symptoms caused by these tumors have no necessary relation to either the size or the consistency of the growth. In this group there are added to the deformity more or less disability and suffering of intermitting intensity and a distinct element of danger.

3. Tumors which, either with or without local pressure-symptoms, are associated with profound systemic disturbances, the chief of which are grave neurasthenia, tachycardia, tremor, insomnia and exophthalmos. In this group the symptoms are crippling and usually progressive, and the whole mentality is changed. The growth may be small or large. Contrary to the generally accepted opinion, it is not usually more vascular than the solid and cystic goiters of the first two groups, nor histologically can there be detected any difference in the processes

of hyperplasia, infiltration and degeneration characteristic alike of the exophthalmic, the solid and the cystic goiters. Even symptomatically there can be drawn no sharp distinction, as it is common enough to observe an ordinary goiter in the course of its growth gradually become associated with symptoms of Graves' disease.

Of the three clinical groups of thyroid enlargement described, cases in all are proper subjects for surgical intervention, provided a careful trial of medical means, including electricity, has proved unavailing. In the first group of cases, *i. e.*, those in which the tumor troubles only because it is unsightly, operation may be deferred when the growth is stationary or retrograding and when it is not a source of constant mental discomfort to the patient. When tumors of this first group are steadily increasing in size operation should be undertaken promptly. All tumors of the second class, *i. e.*, those giving rise to local or reflex pressure-symptoms, should be subjected to operation. The indications are urgent when there is recurrent dyspnea. In tumors of the third class the beneficial effects of surgical intervention are so striking and the mortality following operation is so slight that on the failure of medical treatment there should be no hesitation in advising ligation or partial thyroidectomy.

A causeless, comparatively rapid, relentlessly progressive solid, nodular or smooth, rounded, painful tumor growing from the thyroid gland in a woman over 40 years old should always suggest the possibility of malignant degeneration. In men this degeneration is less common. It is difficult to formulate the prognosis of untreated goiter, as statistics bearing on this point are not available, but when the thyroid is once permanently enlarged there is a tendency towards steady growth, and the patient with a small goiter, which is annoying only because of deformity, can count, as a rule, on a slow progressive increase of this deformity and a more or less pronounced neurasthenic condition due to the growth and only to be cured by its removal. Exceptionally the goiter disappears or remains stationary. In a small percentage of cases increase in size occurs rapidly, causes more or less pronounced pressure-symptoms and is associated with an aggravated neurasthenia,

with dyspnea and irregular heart, especially well marked. In a smaller percentage of cases the disturbance of the vasomotor mechanism of the thyroid circulation becomes especially noticeable and a pulsating tumor is associated with the characteristic symptoms of exophthalmic goiter. In a still smaller percentage of cases the symptoms of cachexia thyreopriva develop. Exceptionally the enlarged thyroid undergoes malignant degeneration.

As for treatment it is clearly shown that by general bracing, hygienic, climatic and electric treatment many cases of goiter, particularly those of the exophthalmic variety, may be greatly benefited. Sometimes they are cured. In the recent parenchymatous goiters of young people iodine and the iodides have yielded good results, though the common inefficacy and possible danger of this medication is now generally conceded. Thyroid extract may be expected to cure a small percentage of cases. According to Bruns, however, complete recovery can only be looked for as a rule in young children. But few adults are cured and even in older children the enlarged gland does not diminish to its normal size. Graves' disease is a distinct contra-indication to thyroid medication, as the symptoms of this affection are supposed to be due to a saturation of the system with the normal or perverted thyroid secretion caused by increased blood-supply and hyperplasia of the secreting cells.

Galvano-puncture and injection have both been employed in some cases. An anesthetic is not required and, excepting in cases complicated with dyspnea, confinement to bed or to the house is not necessary. In the treatment of parenchymatous goiter the electric needle has proved most unsatisfactory. The procedure is painful and is often followed by inflammatory swelling and requires weeks or months for its completion. Injections of iodine or of iodoform-emulsion are probably about as safe as the cutting operation. The injection should be repeated every third or fifth day and is especially indicated in the treatment of parenchymatous enlargements. Fibrous and cystic goiters are not amenable to this form of treatment. Brunet records 59 cures in 88 cases treated by injections of iodine. Five or ten drops of the tincture

were injected at each treatment. A number of deaths usually attributable to embolism are reported as a result of the injection of iodine. Garré injected iodoform-emulsion in 140 cases without a fatality; about 12 injections were given in each case, 1 grain of iodoform in ether and olive-oil being employed.

The mortality of operative treatment, by which is meant enucleation or partial resection of the enlarged thyroid, has fallen from over 40 per cent. to less than one-half per cent., in over 1,500 cases operated on by four surgeons. In over 200 cases collected from medical literature by Dr. Francis Patterson and reported by over 30 surgeons, the mortality was about three per cent. Hence it is clear that the operation so little threatens life that its performance may be advised even though there is no more pressing indication for it than the relief of a distressing deformity. The hemorrhage is readily controlled. Dyspnea is commonly relieved at once by division of the deep cervical fascia and turning the goiter forward, though when the tracheal rings have suffered from pressure-absorption the larynx may readily be kinked or compressed and the introduction of a long flexible tracheotomy-tube will be necessary. The anemia often complicating exophthalmic goiter may render the patient peculiarly susceptible to shock. The immediate sequence of the operation may be thyroid intoxication, which is usually transitory; hemorrhage, easily controlled by pressure, consecutive hemorrhage requiring opening of the wound and ligation; dyspnea, due to mechanical irritation of the larynx and trachea and

in part probably to irritation of the recurrent laryngeal nerve, relieved by inhalations of oxygen; sepsis being provided against by most scrupulous attention to surgical cleanliness and, when the wound has been infected as by vomiting, by gauze drainage. The remote effect of the operation would be myxedema due to degeneration of the portion of the thyroid left, readily controlled by feeding with thyroid extract; and recurrence of the growth, which is noted in about 1 per cent. of the cases. The operative danger is so well under control, the percentage of radical cures is so high and the ultimate ill effects are so entirely avoidable that it is difficult to understand why partial thyroidectomy is not more popular in Philadelphia.

Dr. Patterson has found from a study of the reports of five hospitals in this city, namely, Jefferson, University, Pennsylvania, Presbyterian, and Episcopal, that in the last ten years (five years at Jefferson) there were treated in these institutions, usually in the Out-patient Department, 182 cases of goiter, of which 5 were operated on, with 1 death. It is evident that a very small percentage of goitrous patients apply for hospital treatment, because of the belief that the affection is beyond help, excepting grave operative risk; nor is this belief confined to the laity.

The object of this paper and the exhibition of the patients, together with a summary of what has been done in this direction in other parts of the world is to show that the operation is a safe one and that the results are as satisfactory as from any other formal procedure in surgery.

## DISCUSSION.

DR. JOHN B. ROBERTS, with Dr. Martin, thought it rather curious that so few cases of goiter seem to have been operated on in Philadelphia. There must be a considerable number that should be operated on. Dr. Roberts' success with the operation in a small number of cases has been similar to that of Dr. Martin. He referred to a woman seen recently on whom he operated four or five years ago. There is a little scar and in all respects the result is satisfactory. Dr. Roberts has not operated on a large number of cases of goiter, partly because many did not seem to need operation, while in others medical means was sufficient to

reduce the size of the tumor. It is his custom to tell patients, if the tumor does not become smaller in a comparatively short time under medicinal treatment, that operation is proper and is not a very serious matter. It is, however, like all operations, attended with a certain amount of risk, and, as a rule, it is preferable to try the milder means before adopting more heroic measures.

Referring to the case of acute thyroiditis in a diseased thyroid gland, Dr. Roberts stated that he had seen a similar condition once or twice. Last spring a woman with quite a large goiter presented herself with

high temperature and very much the symptoms related in the case of the young girl reported by Dr. Martin. The treatment was conducted on general principles, and there was no suppuration. The tumor diminished, the temperature fell as the inflammation subsided, and, as there was still quite a large cystic growth, it was subsequently opened with a bistoury and a great amount of bloody fluid turned out.

In a similar case seen a few weeks ago a woman came to the hospital with very active symptoms of acute thyroiditis, which it was thought would require operation because of dyspnea; but in a few days the swelling rapidly subsided. Dr. Roberts has seen suppurating thyroiditis in a man. The patient did badly and died, perhaps because incision was not made early enough. With treatment with thyroid extract it may be possible to diminish the size of the growth. Old fibroid bronchoceles can probably not have anything done for them except through operative measures.

Dr. Roberts said finally that he would not operate perhaps in quite as many cases as Dr. Martin, perhaps not quite so soon; but the results are good, the scar can be made very insignificant, the operation is not a very serious one, and the hemorrhage and other complications can usually be avoided in the hands of competent men. Much more hope can now be held out to goitrous patients than formerly. The number of cases in the United States is not so large, and thyroid extract given comparatively early in the disease will probably do much good.

Dr. R. G. CURTIN said his knowledge of enlargements of the thyroid gland has been almost entirely confined to exophthalmic goiter, in which disease the enlargement of the gland rarely causes enough pressure upon the trachea or esophagus to produce even slight dyspnea or dysphagia. It can be conceived that such a deformity could be the cause of mental depression which might aggravate the existing nervous symptoms. Dr. Curtin has seen but one case in which suppuration of the gland occurred, and this was in a broken-down woman in whom ergotin had been injected into the substance of the gland. After several injections the whole gland melted down into an abscess and was discharged without incision. The abscess occasioned very little pain or constitutional disturbance. There was no enlargement of the neck following the abscess. The other symptoms continued the same. In Dr. Curtin's opinion there is not much danger from inflammation in removing the thyroid gland.

In the acute form of exophthalmic goiter the gland is very soft and vascular, so that the dangers of any operation would be thus increased. It seems that in the acute stage the removal would be more serious than in the chronic form.

The enlargement of the thyroid gland attending Graves' disease is only a symptom of a disease the seat of which is located in the sympathetic nervous system,

so that the removal of the gland would not cure the malady.

In proof of the influence exerted by the enlarged thyroid, Dr. Curtin related that he has seen and heard of cases in which the thyroid did not enlarge at all; in other cases the disease continued for years before any abnormal size of the thyroid occurred. Again the palpitation, which is generally the second of the triad of symptoms usually found in this disease, may start years previous to any enlargement of the thyroid. The sensitive condition of the nervous system would be a drawback to the operation, for the excitement and shock preceding and following might be a great disadvantage. Young women, after the acute stage, distressed by the deformity of the neck, might be benefited by the removal of the gland, through the resulting quietude of the mind and nervous system.

In a paper read before the Pan-American Medical Congress last November, Dr. Curtin showed that many of the old cystic goiters were caused originally by hereditary Graves' disease, modified by living in a limestone district, or by other influences. Such cases might be operated on if necessary, but they are usually of chronic form; consequently the patients are advanced in years and would not desire the operation.

Dr. A. A. ESHNER stated that his experience had been considerably larger with cases of exophthalmic goiter than with cases of goiter of other varieties. He did not agree with the view that operation is not indicated in cases of the former. On the contrary, he thought that the indications for surgical intervention would be pretty much the same in both sets of cases, viz.: Excessive size, marked deformity and pressure-symptoms. He would go even a step further in cases of exophthalmic goiter and concur in the removal of the gland for its direct curative effect. The number of cases recorded in the literature in which partial removal of the enlarged thyroid gland in the manner pursued by Dr. Martin has been followed by amelioration or disappearance of the remaining symptoms, viz., exophthalmos, tachycardia, tremor, etc., is now so large as to leave no room for doubt as to the relation between the operation and the result. Cases of exophthalmic goiter are exceedingly rare, if they occur at all, in full-blooded blacks. Not having seen a large number of cases, Dr. Eshner could not speak with positiveness as to the frequency with which simple goiter occurs in colored persons. He referred to the case of a young colored man exhibiting an enlarged thyroid gland of some six months' standing in which diminution in the size of the gland had apparently taken place in the sequence of thyroid medication, one grain of a dried extract being administered thrice daily. In conclusion, Dr. Eshner maintained that thyroidectomy should not be undertaken until medicinal measures had been exhausted, except in urgent cases, as, for instance, when the pressure of the enlarged gland threat-

ens asphyxia, when operative aid must be given at once. Such measures failing, and the symptoms persisting or the patient demanding relief, partial ablation of the gland is indicated.

DR. G. G. DAVIS commended the position taken by Dr. Martin. A certain feeling, so to speak, must be present in the community to support advanced measures, and the report and the exhibition of such cases as those made will tend to strengthen a surgeon in advising more radical measures than have heretofore been customary. The mortality as mentioned as being from four operators can hardly be taken as indicative of the result that the operation would give were it to be adopted by surgeons generally. Goiter is much less frequent in the United States than it is abroad, and the experience that surgeons gain here is much less than that of Continental surgeons, and there is no doubt that experience has considerable to do with the mortality. The operation is in a dangerous region, the neck, and the wound made is an extremely large one; therefore one has not only the operative procedure to perfect, but likewise the after-treatment of the wound, to carry it successfully through. The dangers are illustrated in the cases reported. In one of these there was troublesome hemorrhage; in two there was difficulty afterwards with the breathing, in other words in three out of seven there was some untoward symptom. There is no doubt that in a considerable number of these cases the operation is simple and the gland can be readily turned out. In others the operation would be dangerous, and Dr. Davis has seen an operation for the control of secondary hemorrhage, following the removal of half the gland, in which the patient died upon the table. Death took place apparently from venous bleeding, which occurred deep in the recesses of the wound in the neighborhood of the inferior thyroid veins. The veins seemed to come directly from the fascia, that is to say, to be almost indistinguishable from the fascia, and the surgeon could not promptly and efficiently enough control the hemorrhage with hemostatic forceps or by pressure, and this operator is recognized as a very excellent surgeon, so that the accident was apparently not due to lack of technical ability.

Wolff, of Berlin, advocated some time ago the enucleation of goiter, claiming that by dissecting with a small knife the goiter from its fascia, and following the knife immediately with pressure, it could be removed with little danger and slight hemorrhage. When this proposition was discussed before the International Congress in Berlin the general concurrence of opinion was to the effect that the enucleation could not be effected to such great advantage as Wolff had stated, and practically it is agreed that the ordinary Kocher method is as good as can be used. If one attempts to remove a goiter and gets below the capsule and involves the veins, the bleeding is severe and

is difficult to control, and a case like this may die of hemorrhage. If, on the other hand, the operator keeps without the capsule, even in a malignant case, and by working over at the side, as Dr. Martin has said, and first controls the arterial supply from the thyroids, then the operation can often be performed with comparatively little danger; and inasmuch as he has shown that in, it is to be judged, his first seven cases he has had no deaths, it is perfectly good evidence that a skilful surgeon, at all events, exercising proper care, can perform these operations with a comparatively low mortality. Dr. Davis felt, therefore, that the physician would be justified in recommending, and to a certain extent insisting more strongly than has been the custom in Philadelphia, on the removal of these growths. As far as the operation in Graves' disease is concerned, the experience of Mikulicz, and recent literature, tend to further the employment of excision in these cases, and this is only another instance of surgery encroaching upon the domain of medicine, for it will become more common to treat, so to speak, exophthalmic goiter by excision of the enlarged thyroid gland.

DR. JAMES TYSON said that his experience in the medical treatment of goiter has not been very satisfactory. The small enlargements of the thyroid gland which are slightly conspicuous often yield to medical measures, but large, well-developed goiters do not respond readily to such treatment. Dr. Tyson was impressed by Dr. Martin's paper as to the possibilities of the operative treatment of these cases, and he was much more favorably disposed towards operation than before he had heard it.

DR. EDWARD MARTIN said that the remark in regard to thyroid feeding possibly limiting the number of cases that come to the surgeon is an apt one, and the indications for this treatment are fairly well formulated now. As a result of observations in from 80 to 100 cases it has been shown that recent parenchymatous goiters in very young children can be as a rule cured. In children of older growth they can often be cured. In adults they cannot be cured. In cases of cystic or fibrous goiter the treatment is utterly vain. In cases of exophthalmic goiter it is distinctly toxic. In the class of young people with recent parenchymatous nodules thyroid treatment certainly promises well.

In regard to interference with exophthalmic goiter, it seems to be very difficult to distinguish between exophthalmic goiter and simple goiter. Of course, a typical example of each is distinct enough, but the pathologic and symptomatologic merging is so gradual that it is difficult to draw any sharp line of separation. Exophthalmic goiter should be subjected to the same treatment as the simple variety.

The operation when indicated should be performed before these changes take place, which are to a certain extent irreparable.

It is a question whether exophthalmic goiter is a cause or a result of a nervous lesion. In the cases of goiter reported, the tumor, even in its cystic form, has been almost always associated with a pronounced degree of neurasthenia and hurried heart-action. Except in one case these symptoms have all cleared up after the operation, and the experience of surgeons who have had infinitely wider opportunities for observation is in corroboration of the fact that, no matter what the nature of the goiter, by its partial removal the symptoms are relieved or cured. There are now on record over 200 cases of partial excision of the enlarged gland of exophthalmic goiter, and the results demonstrate as well as anything can that improvement follows in proportion to the wisdom in selection of the amount of the diseased gland to take away. Of course, all discussions as to the beliefs in this matter are founded only on theory, but the theory that seems most plausible in regard to the symptoms that accompany exophthalmic goiter is to the effect that these are due to hyper-thyroidization.

Still the question is by no means clear, and no one has yet absolute proof to adduce against exophthalmic goiter being the result of a nervous lesion. Certainly to a surgical mind it seems the other way.

As to the advisability of operating on exophthalmic goiter when vascularity is a pronounced feature, the tumor being small, surgeons of widest experience will advise

ligation of the arteries, three or even all of them, in preference to excision, as it is considered somewhat the safer operation; at any rate the results are extremely good.

The remark in regard to a mortality greater than that of  $\frac{1}{2}$  per cent. from four operators is no doubt justifiable. The fact seems marvelous. The malignant cases are, however, thrown out. In other words the figures are just a little juggled with, and it cannot yet be said to what degree, but the mortality of the cases reported by some thirty surgeons is about  $3\frac{1}{2}$  per cent., and that is probably about the mortality to be expected in the United States. Continental surgeons are scarcely any more careful than American surgeons, and they are no more clean. The operation requires no special skill beyond that which may be expected of any surgeon.

The object of the paper presented was to encourage the feeling that in advising a patient to have a goiter operated on, the physician is not taking any great risk, certainly not greater than that involved in the removal of a chronically inflamed appendix or in relieving chronic ovarian trouble.

The patients that come under the surgeon's notice now are those people who have passed the limit, who come for operation and often in very ill condition. It would be well to get patients to come before they reach that limit, and the result might be the relief of the suffering, with a mortality somewhat better than that given.

## HAY-FEVER.

EDMUND W. HOLMES, M.D.

[Read October 13, 1897.]

*Synonyms*:—Hay-Fever, Summer-Fever, Rag-Weed Fever, Snow-Fever, Hay-Asthma, Rye-Asthma, Pollen-Asthma, Pollen-Poisoning, Pollen-Catarrh, Bostorck's Catarrh, Catarrhus *Æstivus*, Summer Catarrh, Summer Catarrh from Idiosyncrasy, Typical Early Summer Catarrh, Autumnal Catarrh, Summer Bronchitis, Rose-Cold, Peach Cold, Harvest Cold, June Cold, July Cold.

In view of the limitations of time and of your amiable endurance I will plunge at once into my subject, especially as thereby both you and I will be spared a lengthy disquisition upon Meckel's ganglion, the fifth pair of nerves and their relations to the pneumogastrics, which I should feel constrained to indulge in, were

I writing for publication in to-morrow's daily press.

Hay-fever was first clearly recognized by Dr. John Bostock, in 1819, himself a sufferer, and by Drs. Gordon and Elliottson a year or two afterward. I find, however, that it was fashionable even at that time to regard the disease as of recent origin; yet Elliottson mentions one patient who was 66 years old who had it from his seventh year, and another since 1798, and a third for many years. C. L. Parry, of London, records a case in 1809. and another in 1811. John Floyer, London, 1698, noticed that certain attacks of asthma were longer and sharper in summer than in winter, and in Good's "Study of Medicine," there is a reference to a case related by Timaeus, 1667, of an attack



caused by the odor of roses and ipecac. Dr. Bostock found that hay-fever was known to the laity, but not to the profession; nevertheless, their own King, George IV, had the disease.

A part of the mysterious origin must be set down to the indifference of the sufferers, who from year to year have forgotten their periodic affection and failed to consult their physicians. Of similar cause is the groundwork of the assertion that it affects only the wealthy. This is simply because with this class there is a higher intelligence and closer attention to ailments, and the fact that once having discerned the actual condition they, in many instances, take professional advice, or go to a place of refuge, thus drawing notice to themselves, all of which things are denied to the lower (poorer) classes. It is said that there are some 200,000 sufferers in the United States, at least within the range of observation of the Hay-Fever Association, which, meeting annually at Bethlehem, N. H., may be held to represent the more stable and well to do. From my own experience and observation I am convinced there are many of our working people who suffer from this affection who do not even now, to this day, recognize the disease.

The salient trait which most attracts the attention of the student of hay-fever is its annual recurrence. This is grafted on its very nature, becomes the central point of diagnosis, the chief characteristic, and to the elucidation of this all existing theories tend. It is, however, not sufficiently recognized that we come here upon a problem which we are totally unable to solve, and we can by no means be wiser on this than we are in the discussion of other conditions.

The reasons of the rhythmic measures of the most ordinary of every-day events are not and cannot be understood. Their unfailing occurrence at the appointed time is recognized, but the determination thereof then, rather than at some other period, cannot be explained. This is true not only as to the world around us, but as to ourselves. Health and disease afford abundant illustration. The fixation of the number of heart-beats, or of the respiratory movements, of the cycle of menstruation, or of the period of gestation, is alike as indeterminable as the cause of the mu-

tations of the typhoid temperature, of the recurrence of hectic, of the regularity of the return of the types of ague upon the second or third or fourth day, or of hay-fever upon its annual date. We are bound to accept these as fixed laws, but further than this we can hardly go. As the rhythm of physiologic effects is under the control of the central nerve-ganglia, and as intermittency is a peculiarly marked feature of so-called nervous disorders, so far the annual return and its variations are evidence of the neurotic origin of hay-fever.

The pollen-theory rests upon its more obvious explanation of this difficulty. The investigations of Dr. Blackeley, of Manchester, published in 1873, from observations extending over more than ten years, are remarkable for their originality and ingenuity. He experimented upon himself and others with various agencies to ascertain the origin of the malady. He decided against the efficiency of ozone, light, heat, dust, benzoic acid, coumarin, the odoriferous principle of hay, odors of various flowering-plants, as violets, roses, etc., and against various microscopic fungi. He then tested the effect of the pollen of seventy-four kinds of plants and grasses. Within thirty minutes the rye caused coryza, occlusion of the nostrils, and sneezing, lasting for six and eight hours. The apparatus for testing the quantity of pollen in the air consisted of a disc of glass, with a vane to keep the glass continually facing to windward, and upon this was placed a microscopic slide one centimeter in diameter, coated with glycerin, by which the particles floating in the atmosphere were caught by the slide. During the latter part of May but few pollen-grains were found. About June 1 they began to increase and his hay-fever also. The variation in the amount of pollen in the atmosphere corresponded with the degree of severity of the attack. Unfortunately, in accordance with this, it has been found necessary to specify numerous individual irritants.

Emanations from hay, Indian corn, bean-flowers, roses, lilies, elder-trees, in bloom, and various other blossoms; from nettles, ambrosia artemisiaefolia, ambrosia hertifolia, golden rod, and from various fruits and vegetables, have been cited as causes of the disease: but I am not aware that any specialized action has been

proved; all alike act (if at all) by mechanical irritation. If we define a cause as a "constantly precedent," and an effect as a "constantly subsequent" event, the need of an array of causes is most embarrassing to the immobility of the theory, but volumes for its elasticity. A theory that gave thirty or forty causes for cholera, and claimed that it depended on the "idiosyncrasy of the individual," which one evoked the disease in a given instance, would not be very tenable.

The type of the disease seems to vary in different countries, though in their essential characters the same. In England patients are said to be at their worst in June and July, in this country during August and September. In the United States some attacked in May are well by July 1; some attacked in July are well by August 15; some attacked in August are well by November 1; some unfortunates suffer throughout the whole period from May to November—"the missing link."

Those suffering from the June type may occasionally have a September attack, or it may be changed into a permanent August visitation. The August type may disappear in a certain individual and reappear as a June cold. A parent having the June cold may transmit to his child July or August cold, or all three, or of several children each may have a different type, and so, *mutatis mutandis*, of the others. Any or all of these forms may accrue to the progeny of asthmatic parents. It seems, therefore, as if, wherever occurring it were a manifestation of one and the same disease.

We are informed by a well-known and competent authority that the limited variation of flowering out-door plants would be, in Pennsylvania, to the extent of and not exceeding three weeks. Their punctuality to the self-same date yearly is an obvious absurdity, depending as they do upon the variations of the seasons. As thus the date of the flowering of plants varies within certain limits, the alleged appearance of the disease upon a certain day and hour is unaccounted for. While individuals suffer variously in May, June and August, and some from May till October (connecting links between all these types), and in course of years change from one type to another, and even occasionally become well without treatment, these

facts prove the immutability of the blossoming date, or, more rationally, its limited variation, the change from the control of the cause is incomprehensible.

Moreover, even as a mere irritant, as it affects comparatively few, it must act upon a condition which is pre-existent, which is, therefore, independent of and predominates it, else would the cause, pollen, produce it universally.

Under the name of hay-fever, then, is included a group of symptoms having for their chief and essential characteristic their periodic appearance, classed under a variety of names according to their time of appearance or fancied cause—June cold, July cold, peach-cold, rose-cold, autumnal catarrh, etc.

The symptoms of the disease are a sense of lassitude, in some reaching great prostration; irritation of conjunctival, nasal, bronchial and other mucous membranes, adjacent and continuous, extending at times even to the digestive tract, and manifested by excessive secretion from the parts affected; cough; asthma; well-marked injection and swelling of the tissues; and fearful and wonderful paroxysms of sneezing. This sneezing is not ordinary. I have frequently on the street been compelled to seize some friendly support, blinded and staggered by the violent stertutations. On entering a room I have had to bury my face in my handkerchief and sneeze it out, then, recovering myself as best I might, with face like the rising sun, brace myself for work. These symptoms are not all of equal severity in every case. One patient may be troubled mainly with coryza, another mainly with asthma, while a third may go through a course, at first of catarrhal symptoms affecting the naso-pharynx, followed later by asthma. I think it will be found that, other things being equal, the younger the patient, the greater is the predominance of the catarrhal, while in older persons, and in the more confirmed cases, the greater is the suffering from the bronchial and asthmatic symptoms.

Bosworth considers the pathognomonic conditions to be the long continuance of the paroxysms of sneezing; then the watery, serous discharge, with the bluish gray "tinge of the mucosa verging on opalescence, the surface of the membrane being covered with slightly viscid, watery

serum, which gives it a glassy, semi-transparent aspect," the hyperemia being "confined entirely to the large venous sinuses, the capillaries of the mucous membrane proper not being congested." I am not aware that such sharply diagnosticating conditions have been seen by any one else, and it seems as if they were observed through the spectacles of his theory of nasal reflexes described in one of his preceding chapters.

Upon examination of the nasal cavities we find, upon the lower border of the turbinated bones, that the mucous membrane is disposed in thick loose folds, owing to the peculiar arrangement of the net of arteries and veins constituting "cavernous tissues," its characteristic being that it may suddenly be gorged with blood, resulting in extreme distention, and almost as suddenly be collapsed and relieved. This cavernous tissue is especially thick over the inferior turbinated bone and lower and posterior part of the median septum, as well as upon the lower edge of the middle turbinated bone. This distention in acute conditions quickly subsides, but in cases of chronic disease the mucous membrane is markedly thickened, the blood-vessels enlarged and tortuous, and the passages closed to a greater or less extent.

It is claimed that there are three reflex areas peculiarly impressionable, one at each extremity of the inferior turbinated bone and one (not so well proved) higher up in the vestibule (or anterior portion of each nasal cavity), which, when irritated either by disease or "*ab extra* irritation," transmit the impression to the nerve-centers, and by them is imparted to distant organs. So that, for example, a tumor pressing upon the posterior extremity of the inferior turbinated bone might cause violent cough and spasm of the bronchial tubes, which disappear on removal of the growth. It is said that all parts of the cavernous tissue are not equally susceptible to irritation; the sensitive areas are the inferior turbinate (the posterior and middle reflex areas) and the portion of septum immediately opposite, being particularly related to cough and asthma; the anterior, in the vestibule, to sneezing, lachrymation and other catarrhal symptoms. We might compare these with certain other cases of reflex asthma (not hay-fever) benefited by removal of the tonsils.

It is asserted, in view of these facts, that in hay-fever the cavernous tissues become engorged and fill up the passages, and the several areas being impinged upon, the various characteristic phenomena follow.

Of the nature of the peculiar irritant, pollen, we can say but little, excepting that the microscopic appearance of the horns and briars thereon, in the mind of the theorist, amply support the hypothesis.

The theories of hay-fever may be, then, thus summarized:

1. It may be due to chronic nasal catarrh, upon which the exciting cause acts with effect, with its dependent hyperesthesia, congestion and obstruction, the centric nervous symptoms being secondary to the hyperesthetic condition of the nostrils. The extremists even deny its existence as a separate entity, regarding hay-fever merely as a condition—a form of ordinary catarrh.

2. It may be due to functional activity or paresis of the governing (vaso-motor) centers, with hyper-excitability of the erectile (cavernous) tissues, in response to peripheral irritation. The erethism of the cavernous tissue, though secondary to the centric condition, is the immediately essential part, the most serious symptoms coinciding with the swelling of this tissue, and being dissipated with its subsidence—a vaso-motor disease.

3. It may be due to an organic alteration of the nerve-fibers terminating in the nasal region, and chiefly in the three reflex areas.

4. It may be one of the multiform manifestations of the uric-acid diathesis.

In all these theories there is more or less firm belief in the agency of the pollen, either in inducing the disease or, at least, the paroxysms.

A summary of the local pathology would then be:

The symptoms of hay-fever are due to the obstruction of the nasal passages, the result of chronic nasal disease. Hereby is set up a special and extraordinary irritability of the terminal nerve-fibers, perhaps with organic alteration thereof, and resultant excessive excitability of the nasal and other mucous membranes and of the cavernous tissues, together with hyperesthesia of the nerve-centers, the degree of irritability varying with different individ-

uals and under the stimulus of certain special irritants. As a result of this organic alteration and tumefaction the reflex sensitive areas are directly involved or impinged upon, and the reflex phenomena in varying proportions of cough, asthma, sneezing, lachrymation and a congestion of tissues, contiguous and continuous, with resultant general prostration, ensue. The greater the local congestion and inflammation the more constant the reflected symptoms. Certain observers declare that in all cases of hay-fever there is chronic nasal disease which is the original starting point; but others deny this, maintaining that there may be only hyperesthesia, especially of the reflex areas, without further evident disease.

It is exceedingly unfortunate for the strict "localists" that all cases of hypertrophy of the nasal mucosa are not attended with hay-fever, nor all cases of hay-fever associated with observable organic lesions: that the excessive hyper-sensibility of the membrane of hay-fever is not accounted for, nor its periodicity explained; and that many of those treated strictly according to these methods are not cured. I note an example, most carefully reported, in which with cold snare and galvanocautery all obstructions were removed, and areas rendered anesthetic, so that a probe no longer excited reflex symptoms, yet the patient suffers from hay-fever with scarcely diminished intensity. Further, it is not seen, perhaps, that there is a possibility of at least a degree of the conditions described being the result (especially in acute hyperemias) and not the cause, the peripheral susceptibility being an outward expression of an inward state.

We are grappling with a difficult problem, because we have to deal with a mucous membrane, one of the most complex structures, containing fibrous, muscular, nervous, vascular and secreting tissues, and we meet with the same rebelliousness to treatment here as in the vaginal and uterine mucosa, to the refractory and lasting nature of which diseases the huge pocket-books of the specialists are a bulging testimonial. Again, if a patient had typhoid fever with ulceration alone, and the incautious eating of a pancake resulted in diarrhea or perforation, we would hardly call the pancake the cause of typhoid fever.

The cause must be antecedent to the effect, and to my mind there must be some morbid condition, the nature of which we do not understand, which is at the bottom of this malady. No specific action of the pollen having been shown, it must be concluded that this acts merely as an irritant, an effect shared in common with any fine dust in sufficient quantity.

The confusion of theories has arisen from the fact that the paroxysms have been mistaken for the whole disease. I am inclined to believe that the effects of the different varieties of pollen are mental rather than physical, and that the only activity thereof is its possible presence as dust. Further, I am inclined to think this differentiation to be rare among hay-fever patients. I believe the disease to be in great part a neurosis, originating in local disease in the naso-pharynx, the characteristic manifestation being in part direct, the result of central nervous modifications, and in part reflex, from the action of various mechanical irritants, aided by local and constitutional factors when they exist, and by seasonable and climatic influences, the periodic and peripheral susceptibility being in particular expressions of certain impressions.

Solong as the cause was held to be an external one there was little encouragement for treatment and but little progress was made. I am hopeful, however, that with a more comprehensive study of the nasal tissues, and particularly of the nerve-supply and nerve-endings, we will learn to master this annoying malady. Our treatment should be directed in two channels:—

#### I. *The Centric Nervous Modifications.*

The internal remedies that yield the best results are quinin in five-grain doses up to the verge of cinchonism, zinc valerianate, extract of belladonna, tincture of opium in five-drop doses, and phenacetin. For the dyspnea, potassium iodid, ten grains every other night, seems to give better results than the same amount in divided doses. The Chapman ice-bag, which is merely a narrow rubber bag, eighteen to twenty-four inches long, filled with cracked ice and applied along the spine for from fifteen to sixty minutes twice daily, has in some cases acted very happily in modifying the symptoms. Care should be taken to make the earlier ap-

plications only from ten to fifteen minutes in duration.

Under this heading would come removal to a so-called exempt region. The degree of immunity varies with the individual, and sometimes with the patients in the same locality in different years. There is much more encouragement, the tonicity of a suitable refuge is more than a temporary benefit, as in a certain number of cases the period of the disease is shortened thereby, so that the length of the necessary isolation is much diminished.

II. *The Peripheral Sensibility.* The local applications may consist of extract of belladonna in the form of a bougie; glycerin and carbolic acid, 1 to 30; or coating the surfaces with vaselin—though to some both glycerin and vaselin act as irritants—and applying a 4 per cent. solution of cocain.

This last drug must be applied thoroughly to be of service, and in fact a test experiment may be made which will give an inkling as to the source of the symptoms. If cocain be applied thoroughly to the nasal cavities alone of a patient with a swollen face, injected conjunctivæ, excessive lachrymation, sneezing and serous discharge from the nose, all these symptoms will be greatly ameliorated and held in abeyance as long as cocain-anesthesia is kept up. Of course, the asthmatic symptoms cannot be thus relieved. Unfortunately, as we well know, the constitutional effect of cocain, the nausea, dizziness, and subsequent depression, are so disagreeable as to prohibit the excessive use of the drug necessary to keep up that effect.

I have found a 2 per cent. solution of cocain phenate with boric-acid solution (gr. v to 1 ounce) sprayed into the nose at intervals, of more use than anything else. The carbolate aids the anesthetic effect and prevents too rapid absorption of the drug.

Of the local treatment by cauterization or removal of hypertrophy, I have very little to say. The means employed are various; the wire loop or snare, or the use of caustics such as chromic, nitric, or glacial acetic acid, or the galvano-cautery—the severity of the operations ranging from a superficial scarification to a more or less extensive removal of tissue *en masse*. Many cases thus treated have re-

lapsed; some few cures are reported. I do not emphasize these measures, because they should not be considered as treatment specific for this disease. In suitable cases, judiciously treated by removal of diseased tissue, as well as by the reduction of hypersensibility and abnormal congestions, the system and part affected are put in the best possible condition not only for recovery from the attacks of hay-fever but for the maintenance of the general bodily health, by the application of the familiar surgical principle of physiologic rest. Let us be assured, however, that we are not dealing with something mysterious and inscrutable, depending upon some obscure condition of atmospheric influence or irritation coincident with a mere idiosyncrasy, but with a true morbid condition existing in the individual, the whole nature of which, I regret to say, we are yet unable to understand. Hay-fever is probably, in its incipency, a disease of the complex tissues of the naso-pharyngeal mucosa, peculiar in that the irritant affects primarily the terminal nerve fibers, the implication of the secreting and vascular elements being secondary, as is shown by the fact that the engorgement of the tissues of the nose and of the face and the excessive lachrymation are largely due to the violent, prolonged paroxysms of sneezing. The pathologic condition subsequently extends by continuity to the bronchial mucous membranes, and later results in a hyperesthetic condition of the allied centric nerve-ganglia. Pollen, like any other fine dust, is a mere mechanical irritant.

For those afflicted by the disease who hope to outgrow it, I may say, although I have known one case of a cure by a trip to Europe, in a gentleman over sixty; another sufferer, who died at the age of ninety-four, had had the disease every year for fifty years.

Personally, with regard to the treatment, with all due respect to our modern rational and experimental therapeutists and to those of our rhinologists who gouge and burn and saw, in spite of all the remedies that I have recommended for others—for myself when an attack comes on—as it has for twenty-two years, and probably will for twenty-two more if I live—I shun drugs and drug-stores and specialists, and flee like a bird to the mountains.

## DISCUSSION.

DR. S. SOLIS-COHEN said that unfortunately he too has had personal experience with hay-fever, almost rivaling Dr. Holmes in length of acquaintanceship. While in the main agreeing with the paper, personal experience, as well as observation of other unfortunates, leads him to differ from some of its conclusions. It may be accepted as an established fact that the nasal abnormalities that may be found in subjects of hay-fever are incidental and not causative. They are neither provocative of the susceptibility nor the results of the repeated attacks. Taking his own case as an illustration, Dr. Cohen's nose, according to the testimony of competent observers, is perfectly normal at any other time than the hay-fever season, and that has been his own observation with many patients. On the other hand, he has seen patients who in addition to their hay-fever possessed chronic nasal disease or abnormality of structure. In some cases it is unquestionably true that relief of the chronic condition, either of inflammation or of deformity, or of hypertrophy or displacement of tissues, or whatever it may be, mitigates the paroxysm; but it is doubtful if in any case in which true hay-fever existed cure of the nasal condition entirely removed the other. In some cases hay-fever is said to exist when the condition is really one of chronic coryza, with recurrent exacerbations. In these cases suitable treatment of the nasal passages will often relieve the disease. One patient, a physician's wife, was said to have hay-fever and had suffered annually for many years during some portion of the period from May to November. But she likewise had paroxysms of sneezing and dyspnea at other times. The attacks were due to nasal polypi and disappeared on their removal. The removal of polypi cannot cure hay-fever; the woman did not have hay-fever.

The specificity of irritants is a little better established than Dr. Holmes is willing to admit. Idiosyncrasy is a real condition. Numbers of patients can take salicylic acid and quinin without difficulty, while others cannot take even the smallest portion of either of these drugs without suffering unpleasant symptoms. So with many other drugs, opium for example. One patient, a druggist, cannot go into his own shop without suffering with sneezing, lachrymation and dyspnea at any time when ipecacuanha is being handled. The idiosyncrasy to ipecacuanha is very similar to the idiosyncrasies that patients exhibit toward the different irritants capable of producing hay-fever. The symptoms resulting from ipecacuanha irritation are very similar to those of hay-fever, and like the latter they disappear when the irritant is removed, or, what is the same thing, when the patient betakes

himself elsewhere. That something more than the pollen or whatever irritant may excite the paroxysm in a given individual is necessary, any one who has studied the subject must of course admit; but it is undoubtedly true that this groundwork being present one patient will respond to one irritant and not to another which affects some other person, with apparently the same train of symptoms. This shows some difference in the individual response to individual excitants, in other words an idiosyncrasy. Idiosyncrasy, however, should not be looked upon as something vague, indefinite, meaningless, but as something that deserves to be studied and its cause brought out. Using the word to express the fact that certain persons react differently from the majority of mankind to certain forms of irritation, it means something. It means, of course, that such persons are abnormal, although the cause of the abnormality remains to be discovered.

Dr. Cohen said that during parts of the month of May, the whole of June, and part of July, roses annoy him excessively. At any time after July he can put his nose into a bouquet of roses without the slightest discomfort. That means, of course, that the hypersensitive condition brought about by something present in the atmosphere during a certain season makes the individual for the time being more susceptible to the irritation of the rose, and that when that something has disappeared the rose in itself is not sufficient to produce the condition. There are others who cannot be near roses with comfort at any time. This year during his hay-fever season Dr. Cohen accompanied his family to the Pocono mountain region of Pennsylvania, thinking that there he would be free from suffering, as he had once spent a vacation there very pleasantly during the latter part of August. He found, however, that he suffered much more than in the city. A friend who suffers at about the same time and in the same way as Dr. Cohen, was scarcely able to stay at Pocono over night. Evidently there is something in the atmosphere there, and probably pollen from the grasses, which affects certain persons and does not affect others, which is there at one season and not at others. The difference of susceptibility of different individuals to certain irritants, however, it may be explained, is an undoubted clinical fact. It is not merely mechanical, one kind of dust acting much as any other kind, for the reason that some sufferers in the city of Philadelphia, where there are always clouds of dust from the asphalt, can live with perfect comfort for nearly ten months of the year, and with comparative comfort even at the very season when they cannot get to the suburbs without provoking unpleasant symptoms,

and cannot at all bear the pure atmosphere in a certain mountain region where the pollen of grass and grain is blown about. The underlying condition differs in different individuals, although the group of symptoms is very often the same. In the large majority of persons it belongs to that group of neuroses which Dr. Cohen has described as vaso-motor ataxia. From this point of view the so-called susceptibility of hay-fever subjects is an unbalanced condition of the vaso-motor system, leading to excessive reaction, upon the incidence of causes that in other persons would produce only a slight reaction. Lithemia sometimes coexists with this condition and often there are gastrointestinal disturbances as well. Undoubtedly by regulating the diet and exercise, thus removing from the blood a number of toxins that in themselves act as irritants upon the nervous system, the suffering brain, and the susceptibility to the external cause may be lessened in many patients. Hay-fever may be looked upon, therefore, in the majority of cases, as a neurosis; primarily a vaso-motor ataxia; secondarily, in many instances there is an increase of the toxins of lithemia or other toxins due to indiscretions in diet, to overwork and to various other causes of toxemia, which further increase the liability to unbalance upon excitation; the cause of such excitation varies with the susceptibility of the patient, and that susceptibility in different forms of irritation is dependent upon an idiosyncrasy which, if unexplained, is not necessarily unexplainable.

As regards treatment, the more cases one sees the less confident is he of the treatment. The man who has seen one case has a cocksure remedy, and the man who has seen a dozen cases has been compelled to use a dozen remedies. The most careful individualization in treatment is required, and while the various groups of drugs that have been suggested by Dr. Holmes meet certain indications, there are others that they do not meet. Unquestionably the best treatment is that given of fleeing, if not as a bird to the mountain, at least somewhere where the exciting cause can be evaded. For many, this is the seashore. One patient yearly suffers with asthma until he can be persuaded to leave his country home and go to the seashore, where he is comfortable. Another has asthma if he goes to the sea, and he must be sent to the mountain. But there are seashores and seashores, mountains and mountains; not all suit every patient. There is a climate in which each patient can be made comfortable; what it is must be learned from experience. Those who cannot go to either mountain or seashore would probably do better in the city than in the inland low country, from the fact that there is less pollen, whether from grasses or flowers.

Of drugs, belladonna and opium, or their alkaloids, atropin and codein, or alkaline sedatives, as strontium bromid, lithium bromid and the like, are sometimes of use; acids

are sometimes of service in correcting digestion and thus reducing the quantity of toxins in the blood. Cocain is too dangerous to be used in a routine way in any case. Many cases of cocain-habit have had their origin in the palliation of hay-fever by the drug. Nearly all physicians who for a while used cocain in their own cases have abandoned it and have ceased to prescribe it for their patients, except in an emergency. Apart from the danger of habit, a tolerance is soon established and the drug ceases to be useful except in that it produces unpleasant after-effects. In asthma inhalations are useful; sometimes of ethyl iodid, sometimes of oxygen and nitrous oxid, sometimes of ether, sometimes of mixtures of chloroform and ethyl iodid, or of ether and ethyl iodid, not of course to unconsciousness. The itching of the eye-lids is sometimes a very distressing symptom. The application of ice is often efficacious in affording temporary relief, and in a few cases the application of "yellow ointment" (yellow mercury oxid, one or two grains to a dram of petrolatum) has given complete relief during the entire period of the attack. In a word the treatment, local and general, is symptomatic and palliative. Complete relief can be obtained only by running away from the irritant.

DR. L. J. HAMMOND said that in a large experience he had found fluid extract of gelsemium, in doses of two minims repeated every three or four hours, do more for cases of hay-fever than anything else.

DR. WILLIAM M. CAPP emphasized the fact that in the treatment of hay-fever more is to be gained if attention is directed to the general condition of the patient's system. Local applications during an attack can act only as palliatives, and nothing more is to be expected of them. They are only temporary expedients. In a general way it may be said that there is no great danger of forming a cocain-habit if the drug is judiciously used; though of course a susceptible patient, with a disposition to drift into vicious ways, might easily become habituated to it. This, however, is a matter more to be considered in treating the patient than in treating the disease. The relief afforded by cocain may be overestimated and too much dependence placed upon its use. Still in Dr. Capp's experience it gives much relief, when used locally in great moderation, chiefly in the earlier and later stages of an attack, but it is hardly of any service during the worst manifestations. It must not be constantly used, and the irritated membrane should not be douched or sprayed with it, but only a drop or two applied from a pipet to each nostril, of a solution not stronger than 4 per cent. During the attack the lower turbinates, the pharynx and the fauces should be sprayed occasionally each day with a mild alkaline or other simple cleansing solution. But, as intimated before, the depressed nervous system demands chief attention. If the cause of its derangement is

known this should be removed. In many cases a lithemic condition exists, perhaps in most cases, and there is call for the elimination of the products of faulty metabolism, and efforts towards the correction of indigestion and malassimilation. Laxatives and tonics are decidedly indicated. If these are wisely used for a short time before the date of an expected attack, two important points are most likely to be gained, namely, the attack will not come so promptly on time, but will be delayed, and when it comes the symptoms will be lighter and more subject to control. Although there are not many cases which may be positively said to have been cured, yet it is possible to mitigate the severity of the symptoms in all cases by proper treatment. It may be seriously doubted if running away to a different locality is of itself equivalent to running away from the disease. Change of scene, of surroundings and of occupation adds a desirable psychic element to this plan of treatment. But there should be something more practicable to advise for the majority of the 20,000 annual victims in the United States spoken of. They are not all able to leave home and "flee to the mountains;" but, doubtless there is obtainable a measure of relief for all. Careful study of each case and judicious prescribing by the physician will make life more tolerable even to those who when sick prefer the accustomed comforts of home to the uncertain shifts of a summer resort.

DR. SAMUEL ASHHURST said that from a long experience with hay-fever and contact with some hundreds of cases he thoroughly endorsed the remark that there is but one remedy—change of residence, whether to the mountains or the seashore. Persons who leave their homes on account of hay-fever, to go to one of the vaunted health-resorts, wait until the attack has begun, and do not then obtain entire relief. When conjunctivitis exists the ordinary treatment for conjunctivitis is helpful; when bronchitis exists a sedative cough-mixture is helpful; if asthma be present (as it always is in cases of hay-fever of long standing in the latter weeks) nothing does so much good as a hypodermic of morphin. It will stop a paroxysm of asthma. Dr. Ashhurst has seen a number of cases in which hay-fever has disappeared. He has been in the habit of late years of looking upon the disease essentially as a personal idiosyncrasy and acted upon by some irritant. Without this personal element it is difficult to account altogether for the symptoms and for their peculiar periodicity, some cases manifesting "June cold," others "autumnal catarrh." It is of essential importance in the case of young children (and many cases begin in very early life) that the patients should persistently be sent away from home before the attacks begin. Dr. Ashhurst is cognizant of several cases in which children had well-marked hay-fever, and by persistently going away from home before the attacks

were due and staying away at places in the mountains, or certain insular localities on the seashore, for a number of years, the disposition to the formation of the habit disappeared; and also of cases in which after lasting for many years a persistent avoidance of home and isolation at one of these places have appeared to entirely break up the habit of periodicity.

DR. W. S. STEWART said that while not a victim of hay-fever he had seen many cases, and he had learned much from observation. Some patients seem to know almost the very date upon which they will have hay-fever, the very hour, whether in spring or fall or summer. Dr. Stewart thought the disease not to depend upon the roses or the rose-pollen. The symptoms appear mostly at the time the farmer begins to cut hay, and from this fact it takes its name. With regard to climatic influences Dr. Stewart has found that patients who go to the seashores are just as susceptible with land-breezes as they are in the city or any other place in the country; but if the breeze happen to be constantly from the sea they are exempt from an attack. Patients who are always attacked at a certain season of the year can take a steamer and cross the ocean and remain away until the season is over and it becomes safe to return. Those who are constant victims of the disease would do as well to remain in the city, as it is as exempt from the peculiar effects that result from pollen, whether it be ragweed in the fall, hay, timothy or clover in summer. Some persons are not likely to be exempt in certain mountainous regions where the ground is not cultivated, but afterwards when the soil has been tilled and cultivated they find themselves subject to the disease as much as in any other place. Having observed that those who have an exuberant growth of hair in the nostrils seem to be more exempt from hay-fever than those in whom this is wanting, Dr. Stewart has suggested the construction of a little strainer of the nature of a sieve, packed loosely with wool, for introduction into the nostrils at the particular period when the disease prevails. As the pledgets become moist or soiled they must be replaced by fresh ones. There is probably something in the fact of screening the air breathed through the nose that seems capable of preventing or at least controlling hay-fever.

DR. HOLMES said, in conclusion, that in regard to the question of idiosyncrasy, he did not wish to say there is no such thing, but he concluded that in hay-fever there is an actual disease whose nature is not yet understood. The lithemic condition has been brought up more prominently of late in connection with hay-fever, and it is quite probable that the former would aggravate the latter condition, as it would any other condition in the body. Some seem to think they have proved this by using salicylic acid, thereby actually aggravating the condition in hay-fever by the elimination of uric acid.



Dr. Holmes believes hay-fever to be primarily a local disease, and in spite of the gentleman of ninety-four cited in his paper, he still hopes that a cure will be found. There may be a difference in the terminal nerves of the nose which is the sole cause of the disease, and the reason that the solution of the problem is not reached lies in the fact that but little is known concerning the terminal nerves themselves.

There is a great deal of danger in the use of cocaine. A number of years ago, in making some experiments for a monograph, then in course of preparation, Dr. Holmes was impressed with the sense of delight from the application of the drug. Such tolerance was established that he could apply 20 grains in solution during the evening. After awhile, however, the drug nauseated so dreadfully that Dr. Holmes cannot put a brush dipped in the solution to his nose. Morphine he is as much afraid of as cocaine, and when the need for its use hypodermically arises he will send for somebody else to administer it.

As to the statement that people who have hay-fever have the attack come on an exact date, Dr. Holmes has found the time of the

attack to vary; although assured in individual cases that it came on at exactly the same date from year to year, it varied from 10 to 20 days. Personally, Dr. Holmes has not yet been able to run to earth a single case in which the attack came on at precisely the same date, not to say the same hour and minute in each successive year.

In regard to wearing anything in the nose, every hay-fever patient knows that it is impossible to use a device of cotton, wool, or anything else.

Dr. Holmes requested members of the society to make notes of their results in going among dust in the winter-time or out of hay-fever season, stirring among old books in the garret or similar places, and see if such exposure produces an attack. In his own case this will produce an attack at any time of the year from mechanical irritation of the nasal mucous membrane.

Pollen acts simply as any other form of dust, in producing the condition, but the idiosyncrasy, using the word according to the meaning spoken of, is at present beyond explanation.

## A CASE APPARENTLY OF TYPHOID FEVER ASSOCIATED WITH TUBERCULOSIS AND NEPHRITIS.

HERMAN B. ALLYN, M.D.

[Read October 27, 1897.]

The following case seems to me of sufficient interest to deserve a permanent record. Briefly, the history is this: A man who had a continued fever of high range and most of the ordinary symptoms of typhoid fever, whose blood responded positively on two occasions to the Widal serum-test, had also tuberculosis and nephritis, which were recognized during life. The man died about six or seven weeks after his convalescence from typhoid fever, of which the autopsy showed scarcely any evidence.

J. J. P., 40 years old, was admitted to the Philadelphia Hospital July 17, 1897, complaining of fever, of looseness of the bowels, and of feeling all "broken up." His father and mother were both dead of causes unknown to him. The patient had had measles, mumps, chicken-pox, pertussis, diphtheria, subacute rheumatism, and small-pox. He denied having had chancre or chancroids, but confessed to at least

three attacks of gonorrhea. He had been a heavy drinker and had used a great deal of tobacco. His occupation of driver exposed him to marked changes of weather. He had never had typhoid fever.

The patient was a tall, rather spare man, of good muscular development, but with the bleared eyes and congested face of a whisky-drinker. He stated that he had been feeling ill for seven weeks. During this time his bowels had been irregular, often very loose and watery, at other times regular, and again constipated. Throughout this period he had complete anorexia, considerable thirst, and he felt that he was growing weaker every day. He would go to bed at night tired, sleep poorly and wake in the morning more tired than he had been on going to bed. He did not have epistaxis during this time, but had aching pains in the loins and limbs, and shooting pains through the abdomen, with a rumbling sensation in the bowels.

The mouth was parched. He had not been able to work during the seven weeks referred to. He tried to drive his wagon one day, but weakness compelled him to quit. He was, however, not confined to bed, but would be in bed some days and up others.

My first impression on seeing the patient was that he was very ill. The face gave unmistakable evidence of dissipation, the eyes were bleared and sticky. The man lay in semi-stupor; the pulse was small, weak, and beating 100 to the minute; the respiration varied from 32 to 38; the temperature was 103° F.; there was slight cough and scanty expectoration. The base of the right lung was dull on percussion, but not very dull; the fremitus was slightly increased, the breath-sounds broncho-vesicular, and there were a few bronchial and sub-crepitant rales. The disease was at first supposed to be a low-grade pneumonia occurring in an alcoholic subject. The man's condition was so bad that I remarked to the resident physician, Dr. Gerson, that the patient had a very poor prospect of recovery, but that he would do best if given only strychnin hypodermically, his stomach being saved for food and a moderate amount of whisky. This treatment was at once instituted and was carried out through his entire illness.

In a few days, however, it was found that the blood yielded the Widal reaction for typhoid fever, and tubercle-bacilli were found in the sputum. The urine at the same time gave unmistakable evidence of nephritis through the presence of albumin and numerous granular and epithelial tubercasts. The case was now looked upon as probably one of typhoid fever, with nephritis, occurring in a tuberculous subject. This probability was strengthened by the subsequent course of the case, the Laboratory of Hygiene of the Board of Health reporting positively as to the existence of the Widal reaction, and tubercle-bacilli being invariably found whenever the sputum was examined.

The patient's temperature remaining persistently high, it was decided to employ tub-bathing as the only admissible antipyretic measure. On account of the man's feeble condition I recommended warm baths, meaning by that baths at a temperature of 90° F. Probably through some

misapprehension of the proper temperature for a warm bath, the patient was put in a tub-bath with the water at 110° F. There was no antipyretic effect; in fact the patient's temperature was higher when he was removed from the water. The resident physician therefore concluded to try cold baths; and on my next visit, finding that the patient bore these better than I had feared, they were continued. From July 20, when the cold tub-baths were begun, to August 13, when they were stopped, the patient had 58 in all. The baths lasted almost always twenty minutes, and the water was at 70° F. The baths were surprisingly well borne. They produced the usual shivering and blueness of the extremities, and very frequently external heat was necessary upon removal from the bath. Yet the toxemic symptoms lessened under their use, the stomach and digestion continued good, the heart kept up, there was no aggravation of the lung-condition, and the kidneys performed their function better than before. At one time, while the baths were in progress, neither albumin nor casts could be found in the urine.

As to the general symptoms, these and the severity of the case may be judged of from the following statements: The man was in stupor alternating with muttering delirium from the day of his entrance into hospital and these symptoms lasted several weeks. At times he tried to get out of bed. He could be roused when spoken to, but would again lapse into hebetude. The stools numbered from three to seven in twenty-four hours; they were liquid, light yellow in color, offensive, and occasionally contained traces of blood. There was no tympanites or abdominal tenderness. During the first week of his stay in the hospital his temperature ranged pretty constantly from 103° to 104°, except as influenced by the baths. From July 26, it took a somewhat lower range; but the tongue continued dry, brown, and heavily coated, and the mental condition did not improve. The urine was passed involuntarily during most of the man's illness, and occasionally there would be an involuntary stool. During the latter part of his first week in the hospital he developed a number of boils—on chest, shoulders, back and legs. These, when opened, left shallow ulcers, which were painful and very slow in healing. One on the back

was about the size of a silver dollar, and around it were a number of small openings communicating with the main ulcer under the skin.

By degrees the fever lessened, the mind cleared, and control was regained over the bladder and bowels. The last tub-bath was given August 13. Soft diet was begun August 15. The patient's temperature was then 101°, not varying much night or day. He was judged to be convalescent from his typhoid fever because the toxemia had nearly disappeared, his appetite was improved, and his functions were better performed. The persistence of fever could be accounted for sufficiently by his tuberculosis, by the ulcers, and by the nephritis.

By August 31 the temperature ranged from 98.6° to 100° F. The stools were small and formed. The urine was about normal in amount. The ulcers were slowly healing.

On September 13, owing to some repairs in the fever-ward, the patient was removed to another ward. Here, after a few days, he was found propped up in a chair reading a paper; but very soon he complained of being very cold and weak. His temperature was now subnormal. He seemed to have no rallying power left, and slowly sank, dying September 21, sixty-six days after his admission to the hospital, and approximately six weeks after apparent convalescence from typhoid fever.

Appended are the notes of the autopsy, conducted on the day after death: The body was that of an extremely emaciated male, with ulcers on the right leg and the buttocks. The eyes were sunken and rigidity was marked. The mesentery was congested, the mesenteric glands enlarged. The gall-bladder extended two inches below the margin of the liver. The pleural sacs contained numerous adhesions, some of which were easily broken up. The pericardium was thickened and contained about two ounces of fluid. The heart was flabby. There were a few aberrant cords; otherwise the heart was normal. The lower lobe of the left lung was in a state of tuberculous pneumonia, with small areas of tuberculosis in other parts of the lung. The right lung was edematous at the base, with small and large areas of tuberculosis and several small cavities. The bronchial tubes contained a large quantity of purulent fluid. The bronchial

glands were enlarged. The spleen was slightly enlarged, its pulp is firm. It presented several small areas (*sic*) throughout the pulp.

The left kidney was enlarged and swollen, the pyramids congested, the cortex narrow and pale; the capsule stripped easily; the surface was smooth; there was a small abscess at the lower part of the kidney, with several small areas in the kidney-substance itself containing cheesy matter (probably tuberculous). The right kidney was slightly smaller than the left; it contained a few abscesses, and its general condition was much the same as that of the left. The ureters were normal. The bladder was thickened. The glans penis was reddened and excoriated. The duodenum and the stomach were normal. The pancreas was normal. The liver was enlarged, dripping blood when cut. Several small areas (? of tuberculosis) of the size of pins' heads were distributed throughout the gland-substance, with evident fatty infiltration. The vermiform appendix was 18 cm. long. Throughout the small intestine were numerous patches of hyperemia and congestion. The mesenteric glands were enlarged. The brain was edematous. A small cyst was present near the pineal gland.

This case suggests several questions of great interest. In the first place, did this man have two concurrent infectious diseases? Did he have tuberculosis and typhoid fever or some other fever, or did he have only the former? I do not think we are yet in a position to say positively that he had or had not typhoid fever. The general course of the disease, the onset of stupor, muttering delirium and looseness of the bowels, with yellow, offensive stools, associated with high temperature, and the gradual subsidence of all these symptoms, speak very strongly for typhoid fever. Stupor and delirium, it is true, occur in tuberculosis, but only in the last stages of the disease or when the cerebral meninges are involved; but in such cases they are progressive to a fatal issue. In this case the man convalesced from the attack, and when later he died the brain gave no evidence of tuberculosis. Again, the presence of the Widal reaction must be regarded as very important testimony as to the present or previous existence of typhoid fever. The blood was examined both by Dr. Kneass, of the Pepper Clinical

Laboratory, and by the Laboratory of Hygiene of the Philadelphia Board of Health, and from both sources the report was positive. These examinations were made soon after the patient's admission to the hospital. I had supposed that they had been repeated at regular intervals throughout the man's illness, and have only learned since his death that this was not so. This is much to be regretted.

In the absence of marked clinical evidence of typhoid fever, I should not be willing to accept the Widal reaction as sufficient, if only because it has been found in cases of miliary tuberculosis, although not, so far as I know, in the form of tuberculosis presented by the patient whose case is reported.

It has been mentioned that the notes of the autopsy are silent as to the appearance of the ileo-cecal region and of Peyer's patches. As I was not present at the examination I can say nothing from personal knowledge. Dr. Gerson, the resident physician, who was present, tells me that Peyer's patches did not exhibit the shaven-beard appearance one would expect to find, and that there was no evidence of healed ulcers. He says, however, that there was one small ulcer in the intestine. In estimating the negative evidence furnished by the autopsy one should bear in mind that we cannot be certain when the patient's supposed typhoid fever began; nor can we tell when convalescence set in. He was ill for six or seven weeks, with symptoms indicating the onset and development of typhoid fever, before his admission to the hospital. The temperature became normal for the first time on August 8. If convalescence is dated from that day then the man lived fifty-one days. Is it certain that the intestines would show unmistakable evidence of typhoid fever seven weeks after convalescence if the intestinal symptoms, as regards ulceration, had not been prominent during the attack?

Another question of great interest is as to the propriety of cold baths in cases of typhoid fever exhibiting great feebleness and complications on the part of lungs and kidneys. My own preference, as already stated, would be first for warm baths at 85° or 90° F., keeping the patient in them for a half-hour or longer. If these should, after a fair trial, prove in-

effective the cold baths might be tried; but after the lapse of the first eight minutes the rectal temperature should be taken every one or two minutes and the patient removed when the rectal temperature reaches 100° F. There is no doubt in my mind that water in some form is the safest antipyretic; the feebler the patient the more it is indicated if high temperature exist.

Finally, as the value of the Widal serum-test must be decided in accordance with the results of repeated trials, all cases throwing light upon it should be recorded. Dr. Abbott informs me that it has so far failed in only three per cent. of over 1100 cases examined by the Philadelphia Laboratory of Hygiene.

After a very imperfect search I have found only two cases in the literature which throw any light upon the case just related. One is a case reported by G. H. Lemoine.\* Here the patient, a man, aged 22 years, had had typhoid fever when 17 years old. When first seen by Lemoine he was suffering from tuberculosis, but exhibited also typhoid symptoms. Bacilli giving all the morphologic and culture characteristics of Eberth's bacillus were found in the stools; but the Widal test was negative. At the autopsy tuberculosis was found, but no lesions of Peyer's patches. Only colon-bacilli were found by culture, but the autopsy occurred twenty-four hours after death. Lemoine thinks the bacilli were latent in the intestine, and failed to produce typhoid fever because the patient was protected by a previous attack of that disease.

In another and more interesting case, reported by Sarda and Villard,† the clinical symptoms indicated a mixed infection, and the diagnosis during life was typhoid fever associated with acute tuberculosis. The patient, a man 30 years old, died after an illness lasting about one month. At the autopsy, which was very carefully conducted by Prof. Kiener, tuberculosis of lungs, intestines and cerebral meninges was found, but in the small intestine there were other ulcers not tuberculous and some in process of healing. From the spleen the bacillus of Eberth was isolated and cultivated upon a variety of media.

\* *Bull. et mem. de la Société des Hôpitaux de Paris*, 1896, 3, n. vol. xiii, pp. 675-676.

† *Revue de Médecine*, 1893, xlii, pp. 352-362.

# DISCUSSION.

DR. A. A. ESHNER said that he had had the privilege of seeing the patient whose case was reported on one or more occasions while he was under Dr. Allyn's observation, but he had little to add to what Dr. Allyn had so well said. He referred to another case which was in the same ward at the same time and which exhibited many of the same symptoms as Dr. Allyn's case. The case was that of a colored man, about 45 years old, who presented on admission to the hospital symptoms considered to be diagnostic of typhoid fever. Blood was withdrawn from a finger and sent to the Bacteriologic Department of the Board of Health. The report came back that it yielded a positive reaction to the Widal test. The case was therefore looked upon as absolutely one of typhoid fever, and the patient was bathed strictly according to the method of Brand. His temperature remained persistently high, although it yielded somewhat to the baths. The man bore the treatment exceedingly well for some four or five weeks, when, the temperature still failing to decline, other specimens of blood were sent to the Board of Health laboratory. The reports upon these came back as to the negativity of the Widal reaction. Upon inquiry, stating that the original observation had been positive, while the subsequent ones had been negative in regard to the Widal test, we were informed by the bacteriologist in charge that the original observation had been reported as positive through a clerical error, and it should have read negative.

The long-continued high temperature, the failure to yield to treatment of all sorts, kept us on the alert for signs of miliary tuberculosis, and this watchfulness was increased when report was received that the Widal reaction was wanting. For a time we were quite unable to find any significant symptom, except the persistent elevation of temperature; but finally small areas of dullness appeared in one lung and breathing in one situation became coarser than in others, with increased vocal resonance and fremitus. There was little or no sputum, and tubercle-bacilli were never found in that which was examined. The blood also was examined, without the detection of the bacilli; nor was the crepitant fremitus, the tactile fremitus, which is sometimes appreciable in cases of miliary tuberculosis, to be detected in this case.

The case continued to progress pretty much in the fashion related, and as it went on, delirium developed and the man grew progressively worse, and death finally ensued, after having been under observation for some ten or twelve weeks. Unfortunately, through misadventure, an autopsy was not held, and we are without positive evidence as to the real nature of the case. My own conclusion, however, is that at no time did the patient have typhoid fever, that the case was one of miliary tuberculo-

sis from the outset, and that the terminal symptoms were probably due to tuberculous meningitis. The case has no special bearing upon the one which Dr. Allyn has reported, nor has it any special significance in regard to the value of the Widal reaction. There is no obvious reason, however, why typhoid and tuberculous infections should not be concurrent in the same case.

In the case of a girl who was admitted to the hospital at the same time as her brother from one house, and in both of which cases a provisional diagnosis of typhoid fever was made, specimens of blood sent to the Board of Health yielded in the one instance a response which was designated as doubtful, and in the other a positively negative one. The case of the boy was under the observation of a colleague. The case under Dr. Eshner's observation went on, and developed a mild attack of typhoid fever. Convalescence was followed by a relapse, which pursued a more grave course than the original attack. In the course of this renewed infection examination of the blood yielded a positive reaction to the Widal test. It is possible that in one or both of these cases a mild attack of typhoid fever gave rise to the development of agglutinating substances in so small a quantity or of such slight activity that they failed to yield the diagnostic reaction, but upon passing through a second attack, a relapse, which was more aggravated than the original attack, the blood then yielded the typical reaction.

DR. D. B. BIRNEY said that in most of the cases in which he had sent specimens of blood to the Board of Health, the reports have come correctly, as shown by the subsequent course. In the case of a man, however, two specimens of blood were sent to the Board of Health, and the report came back negatively in both instances, although subsequently the patient passed through an undoubted attack of typhoid fever.

DR. JAMES TYSON said that there has recently come under his observation the first instance of a positive Widal reaction in connection with the presence of spots and the absence of other symptoms of typhoid fever. A man was admitted to the University Hospital with the prodromal symptoms of typhoid fever. He presented distinct spots, but fever did not develop, the febrile state with which he entered disappearing, and soon the man seemed perfectly well. Specimens of blood were sent to the city laboratory twice, with a positive reaction reported. A further specimen, examined in the Pepper Laboratory, likewise yielded a positive Widal reaction. Careful inquiry elicited the fact that the man had never had typhoid fever. He was kept under observation for a couple of weeks for safety's sake.

DR. H. B. ALLYN said that the chief interest in the case reported lies in the possibility of determining accurately the concurrence of tuberculosis and typhoid fever. As

yet it cannot be stated positively whether that is or is not possible. The clinical course of the disease is more significant than the presence of Vidal's reaction. The continued high temperature, with stupor, delirium, looseness of the bowels, and incontinence of urine, are significant when it is remembered that they were entirely re-

covered from. There must have been some infectious agent at work aside from the tuberculous process. If the cerebral symptoms were purely tuberculous they would have progressed steadily until death, for the mental state of patients delirious from tuberculous meningitis rarely, if ever, clears up.

## FOREIGN BODY OF UNUSUAL SIZE RETAINED UNDER THE RETROTARSAL FOLD OF THE UPPER LID FOR A PERIOD OF EIGHT MONTHS.

JOHN WELSH CROSKEY, M.D.

[Read October 27, 1897.]

H. J. presented himself at the clinic October 12, 1897, complaining simply of a "sore eye," and the following history was elicited.

While chopping wood eight months previously in Russia, a fragment of the wood flew off, striking him in the eye. As the eye caused very little trouble, no special attention was given it. In March last the man left Russia to come to America, and as he crossed to Germany he was subjected to a physical examination; his vision was tried, and as this was good he was permitted to pass. He arrived in this country April 14. The eye was still causing a little trouble; but as it occasioned no special inconvenience, medical aid was not sought.

When he presented himself at the clinic the appearance of the eye indicated a purulent ophthalmia. Upon everting the upper lid there was found, resting securely in the retrotarsal fold, a piece of wood 18 mm. long, 6 mm. wide, and 3 mm. thick,

weighing, when the moisture had evaporated, one and a half grains. The upper lid was covered with a thick tenacious membrane, and at the inner angle was a mass of granular tissue 8 mm. in length, 7 mm. in width, and 2 mm. in thickness. The entire upper lid was somewhat granular in appearance; the upper and inner quadrant of the cornea was slightly hazy; but the bulbar conjunctiva was free from any hyperemia.

The piece of wood was removed, the granular tissue excised, an astringent wash given, and the traumatic conjunctivitis was soon relieved.

The case is reported as one of particular interest; first, on account of the size of the foreign body; second, that it was allowed to remain for so long a time; and third, the little damage to the cornea and adjacent tissues, a possible explanation of which lies in the fact that the piece of wood was macerated and softened by the lachrymal secretions.

## DISCUSSION.

DR. C. A. VEASEY said that all who have to do with ophthalmic work have met with cases similar to Dr. Croskey's, though perhaps not so marked. He related the case of a little girl, four or five years of age, who came to the Jefferson Hospital ophthalmic clinic with a severe muco-purulent conjunctivitis. Her mother stated that this had been present for four months. It had been variously treated, with very little improvement, so that great care was taken to ascertain the cause. Upon everting the lid and looking well up into the retro-tarsal fold a very small dark spot was found which seemed to be not a portion of the conjunctiva, but something imbedded in it. Upon seizing this with a pair of forceps and mak-

ing an attempt to draw it out, a piece broke off which, when thoroughly washed proved to be a bit of cedar. The conjunctiva was cocaineized, an incision made, and a piece of cedar dissected out about three-eighths of an inch long, with several prolongations that had become almost entirely imbedded beneath the conjunctival surface, the only point showing in the situation stated. The mother at once recalled the fact that the child had fallen against a Christmas tree some time during Christmas week, and her eye-trouble dated from that time. The muco-purulent conjunctivitis, which was due to the foreign body, at once cleared up with its removal.

## ABSCESS OF THE ORBIT AS THE RESULT OF SUPPURATING ETHMOIDITIS: OPERATION AND RADICAL CURE.

G. E. DE SCHWEINITZ, A.M., M.D.

[Read November 10, 1897.]

In cases of purulent disease of the ethmoid sinuses the natural escape for the pus is into the nasal cavity, where it can be seen beneath the middle turbinated body, or between this structure and the septum; but according to Bosworth,<sup>1</sup> "this is by no means its invariable course, as is shown by the large number of cases in which the pus escapes through the *os planum* into the orbital cavity, giving rise to exophthalmos and orbital disease." The following case is a good example of abscess of the orbit connected with suppurating ethmoiditis, and illustrates certain important and interesting points in regard to the operative technic:

D. S. W., a grocer, aged 67, born in New Jersey, married, consulted me March 25, 1896, in the hope of obtaining relief from disease of the left orbit.

*History.*—In his early life the patient had been perfectly healthy. About his twenty-first year he was attacked in rapid succession with measles and scarlet fever. As the result of these diseases rhinitis developed, which terminated in the chronic atrophic variety of this affection. He also had inflammation of the middle ear and perforation of the left drum-head.

At the age of 65 the patient had a sunstroke and afterwards much violent headache; indeed, prior to his sunstroke he suffered from brow-ague which was attributed to malaria. For two years before he reported for treatment, and markedly during the preceding year, the headache was located chiefly over the left brow, and was often associated with a swelling at the inner angle of the orbit. For twelve months this swelling had been persistent, and for three months there had been marked diplopia. The patient's habits had always been good. There was no history of venereal disease. His wife and children are healthy.

*Examination.*—The patient is a medium-sized man, with ruddy countenance, the flush on his face being particularly marked during the periods of severe headache. Physical examination failed to reveal the presence of any disease, save that situated in the orbit and in the rhinopharynx.

*Eyes.*—R. E. practically normal, with the exception of a small pterygium at the inner side. The refraction was a moderate compound hypermetropic astigmatism.

L. E. The eye was displaced downward, the center of the cornea, being 8 mm. below the level of the center of the cornea of the opposite side, while the face of the cornea was tipped slightly upwards and backwards. There was no direct forward protrusion of the bulbus. Upward movement of the eye was abolished; the other movements were preserved. There was ptosis from edema of the upper lid, which was most marked upon the inner side. An elastic swelling was situated at the upper and inner portion of the orbit, and pressure elicited marked tenderness, especially in the region of the supraorbital notch.

The ophthalmoscope revealed an oval optic disc, slightly grayish in color, and normal retinal vessels. There were no extravasations in the fundus. V. with +1.50 D. = 6-12. The field of vision for form and for red was normal. There was vertical diplopia in all portions of the field of fixation.

*Rhino-pharynx and Adjacent Sinuses.*—Examination by Dr. Walter J. Freeman: "There was atrophy of the turbinates, which was more advanced on the left side. The fossæ were lined with thick, dry crusts, but no purulent discharge was seen anywhere. On the left side there was an opening into one of the anterior or middle ethmoid cells, about 3 mm. in diameter, and a smaller one in the right side in about the same position. These

<sup>1</sup> DISEASES OF THE NOSE AND THROAT. New York: William Wood & Co., 1896, p. 264.

were probably the result of atrophy, as the patient asserted that no operation had been performed. There was no abnormal bulging of the walls, nor growth of any kind within the nose.

"Transillumination of the antrum of Highmore was good on the right side, but completely absent on the left. The frontal sinuses were shown to be clear on both sides by the same test."

In view of the history of the case, the character of the swelling and the presence of atrophic rhinitis, the patient was told that in all probability he was suffering from an abscess of the orbit connected with either the frontal or the ethmoid sinus, and exploration of the orbit was advised. The absence of fluid pus in the nose, moreover, indicated probable retention in some of the accessory sinuses, which would account for an accumulation of pus in the orbit. As the transillumination-test showed that the frontal sinuses were clear, the evidence strongly pointed to the ethmoid cells as the seat of the disease. Dr. Herman Knapp, of New York, who saw the patient in consultation April 2, 1896, agreed with the diagnosis and the propriety of operative measures.

The edema, not only of the upper lid but of the entire brow as well, rapidly increased, and the swelling previously described daily became more evident. The diagnosis of abscess was now unquestioned and the patient was again urged to submit to operative interference. Consent having been obtained, on April 11, 1896, at the Polyclinic Hospital, assisted by Drs. H. R. Wharton, C. A. Veasey, and Walter J. Freeman, I made an incision through the brow from the inner to the outer angle and opened the orbit. Immediately there were evacuated several ounces of thick, greenish-yellow pus, which had been contained in a pocket at its upper and inner part. The inner two-thirds of the supraorbital margin and a portion of the roof of the orbit were found denuded of periosteal covering, a carious process having already begun in the orbital margin. The pulley of the superior oblique was recognized and found loosely adherent to a fragment of carious bone, which was detached. All diseased portions having been carefully removed with chisel and curet, especially the necrotic area in and around the ethmoid foramina,

attention was directed to a small cavity at the upper and inner portion of the orbit, which for the moment was supposed to be the frontal sinus, exposed through absorption of its orbital wall. Further investigation, however, proved that this observation was inaccurate and that the frontal sinus was intact, and, as was subsequently shown, did not participate in the disease, which was confined to the ethmoid sinuses.

The floor of the orbit was now perforated at a point corresponding to the junction of the lachrymal bone, orbital process of the superior maxillary, and the *os planum* of the ethmoid. Through this perforation a probe was passed, to which was attached a fenestrated drainage-tube. The probe was gradually insinuated into the upper portion of the nasal cavity and brought out, together with the drainage-tube, through the left anterior naris.

As transillumination had revealed opacity in the upper part of the maxillary sinus of the left side, it was deemed advisable to tap this cavity through the canine fossa, in order to ascertain whether or not there was a collection of pus. This operation was, at my request, performed by Dr. Freeman, with negative results.

The wound above the orbit was closed with interrupted sutures and a full antiseptic dressing was applied. The subsequent treatment consisted in frequent spraying of the nose with Dobell's solution, hydrogen dioxid and other mild antiseptics according to the circumstances, and washing out the drainage-tube three or four times a day with a solution of mercuric chlorid (1 to 8000). For a few days there was a good deal of swelling of the lid, but perhaps not more than was present before the operation. The vision of the eye was good, the headache was materially relieved, and the temperature at no time rose higher than 101.4° F.

On April 26, the eye had assumed a well-nigh normal condition. The drainage-tube was removed and for it was substituted a drain of iodoform-gauze. Two days later violent headache began, followed by enormous swelling of the upper lid and subnormal temperature. Both the swelling and the headache were greatly relieved by the evacuation of a large quantity of inspissated matter, which apparently came from the anterior ethmoid



cells. The gauze drain was replaced by a new drainage-tube.

As the edema did not entirely subside, and as there was much brawniness of the upper lid, indicating deep-seated orbital disease, and furthermore, as there was a distinct sense of fluctuation at the outer side of the orbit, the temporal side of the old incision was opened and a large quantity of pus, which had accumulated in a pocket on the outer side of the orbital cavity, was evacuated. Some more carious bone was discovered and curetted away, and an additional drainage-tube, passing across the orbit from one angle of the wound to the other, was inserted.

From now on the recovery was practically uninterrupted, the treatment consisting, as before, of daily irrigation through the drainage-tubes and constant attention to the naso-pharyngeal disease.

On May 23, or ten days after the second operation, the drainage-tubes were replaced by silkworm-gut. On June 2 all drainage was removed, and on June 11 the patient was discharged from the hospital, with the wound healed in all portions, except at the inner angle, where a small sinus remained, about two inches in depth, leading apparently to the ethmoid cells.

This sinus continued to discharge a drop or two of pus for about six weeks, when, under the influence of gentle packing, it gradually closed. For a time some edema of the upper lid and the brow remained. This gradually subsided, and the diplopia, which was typical of that caused by paralysis of the superior oblique—all of the classic symptoms of this palsy being present—slowly disappeared. At the present time, more than a year after the operation, it is difficult to develop diplopia, even with the aid of a red glass. There are no ophthalmoscopic changes, and the function of the eye is perfect in all respects. The lid and eye possess normal movements, the growth of the eyebrow has covered the scar, the patient has been entirely free from headache, the atrophic rhinitis has greatly improved, and there is no purulent discharge within the nasal fossæ, showing that the cure is radical.

The exposure of the diseased area in a case of this character is a matter of ordinary operative interference and requires no comment, but much interest centers

in the proper method of drainage after the orbital abscess has been evacuated and the diseased tissue of the sinus as thoroughly as possible removed. The experience derived from this case, and from others that have been reported, proves the value of drainage of the diseased area through the nose. Precisely as in operations on the frontal sinus, the best results follow the plan that establishes by means of drainage a communication between the sinus and the nose. It would seem, however, that when the orbital disease has become extensive and the infiltration of purulent material widely disseminated through the soft tissues, an additional drain is advisable in the manner in which it was applied at the second operation. Were I to meet with another example of this affection, presenting like clinical characteristics, I would establish nasal drainage and also drainage from the outer side of the orbit at the same time. There seems no doubt that the main abscess, which was primarily evacuated, had existed for a sufficient length of time to be walled off from the deeper tissues of the orbit, and by pressure to have caused an indentation of the inner orbital wall, which gave the impression of an open frontal sinus. The pressure having been relieved, areas of purulent infiltration existing further towards the apex of the orbit spread forward as time wore on and occasioned the second abscess, which was later evacuated and drained. The drainage-tubes placed in the manner related afforded the opportunity of constantly irrigating all of the diseased tissues with antiseptic fluids, which flowed freely through their fenestrations. Thus not only the original focus of suppuration in the ethmoid, but the secondary foci in the orbit were continually disinfected, with the happy result of producing what may certainly be described as a radical cure; for, as Dr. Freeman has pointed out, the absence of fluid pus in the nose shows that the disease has been entirely cured, and not merely that the old original passage into the nose has been re-established, as is usually the case. Touching this question of drainage, reference may be made to a case reported by Adelheim<sup>2</sup> of mucocele of the ethmoid cells, which underwent suppuration after accidental infection

<sup>2</sup> *Archives of Ophthalmology*, New York, 1897, XXVI, pp. 142-143.

from the nose, thoroughly cured by an operation that opened the inner wall of the orbit, leading into the ethmoid cells, which were scraped out and the cavity drained by a T-formed tube, one part of which was brought out through the nose. Although it is not definitely stated, it is evident that the other portion of the tube came through the orbital opening.

A second interesting and gratifying fact is the rapidity with which the tissues regained their normal functions. In less than three months after the operation everything was solidly healed, even the small sinus which persisted and which led to the ethmoid sinuses having closed.

In a case of extensive orbital involvement as the result of ethmoid disease, such as I have detailed, there is of course only one way to attack the affection: that is, in the manner already described, by an operation through the orbit. It is, however, also pertinent to urge, in the words of Gruening,<sup>3</sup> "surgical procedures from the orbit in cases of uncomplicated empyema of the ethmoidal cells." In fact, as this surgeon states, "it seems advisable to substitute more frequently the orbital for the intra-nasal operation, even in the earlier stages of purulent ethmoiditis, the evident advantages of this operation being the possibility of direct inspection and exploration of the ethmoid spaces, the greater facility of removing granulations, polypi and carious bone, and the improved chances of securing

drainage through the nose by perforating the floor of the ethmoid body."

It is unnecessary in the present communication to elaborate the ophthalmologic symptoms in general ethmoid disease. Those interested may consult with profit a paper on this subject by Dr. Thomas R. Pooley.<sup>4</sup> To one class of cases, however, I would like to call attention, namely, those of fistula of the orbit above the internal canthal ligament due to disease of the ethmoid. These have been described by Gruening,<sup>5</sup> and he has effected a cure by forcing, with a strong probe, an opening through the base into the nasal cavity, thus facilitating drainage through the nose. In a recent case of this kind under my care, and by my request also examined by Dr. Walter J. Freeman, the sinus is in exactly this position, or perhaps a little lower down, and through it a probe may be passed either into the anterior frontal cells, or else directly into the ethmoid, and from the latter situation into the nasal cavity. Cases of this character have sometimes been mistaken for instances of lachrymal disease, and, in fact, they present some of the characteristics of the so-called pre-lachrymal abscess. The evident treatment, however, is the one recommended by Gruening, or perhaps a more formal operation, in which the diseased area is exposed through a curved incision, the carious bone removed, and both external and intranasal drainage established.

<sup>3</sup> NEW YORK EYE AND EAR INFIRMARY REPORTS, 1891, III, Part I, p. 21.

<sup>4</sup> *The American Journal of Ophthalmology*, St. Louis, 1897, XIV, pp. 100-106.

<sup>5</sup> NEW YORK EYE AND EAR INFIRMARY REPORTS, January, 1898.

## DISCUSSION.

DR. W. J. FREEMAN said that the reported case is especially interesting to rhinologists because of its probable origin in the ethmoid cells. Orbital abscess may occur without any direct connection with or infection from the ethmoid cells and an examination of this patient showed absolutely no sign of purulent ethmoiditis at the time he was first examined. There evidently had been in the past, trouble with the ethmoid cells, as was shown by perforation in the middle turbinals, where the cells had evidently enlarged and discharged by an abnormal opening into the fosse. There had been spontaneous cure of the disease in a number of ethmoid cells, and probably also in the left superior maxillary sinus at the same time, the

disease lingering in the cells near the orbit and finally rupturing into it. At the present time the lining of the superior maxillary sinus on the left is probably very thick, for the test by transmitted light shows it to be perfectly opaque. Chronic suppurative ethmoiditis is much more uncommon than many are willing to admit, and Dr. Freeman's experience is fully borne out by Bosworth's report in his new book in which he confesses seeing only five or six cases yearly. On examining most of the cases referred to him in which the attending physician suspects ethmoiditis, the pus really comes from the antrum of Highmore.

The present condition of Dr. de Schweinitz' patient is excellent, although there is

some crusting from an old atrophic rhinitis; this also, however, has certainly been greatly benefited by the operation.

DR. S. D. RISLEY said that the accurate, almost normal, movements of the eye in the case reported are quite remarkable under the circumstances. The case presents many points of great interest to both the rhinologist and the ophthalmic surgeon. Unfortunately one cannot have any very extended ophthalmologic experience without having met similar cases of suppurative disease of the orbit. Many of them are certainly obscure in their origin. Dr. Risley admitted that he may have overlooked in some of the cases that have fallen under his observation a possible origin in disease of the ethmoid cells or the upper nasal passages. It is not always easy to account for the occurrence of suppuration in the orbit. There is of course no difficulty in diagnosis in cases in which injury has been inflicted upon the orbital ridge by blows or falls, followed in turn by periostitis with suppuration, and by necrosis of the orbital wall. The first point in interest, therefore, is the possibility of a more frequent origin of suppurative disease of the orbit in disease of the nasal passages than has been generally recognized. The technic of the operation in the case reported seems to have been perfect, as the results show. It is quite remarkable that the function of the superior oblique should have been so perfectly preserved. The report illustrates another point of great importance, viz.: the difficulty of differential diagnosis between suppurative disease of the orbit and malignant growths, dermoid cysts and affections of the lachrymal gland. Dr. Risley related a case of apparent extension of disease from the maxillary antrum to the orbit, and which ended in the death of the patient. The antrum was opened, revealing extensive necrosis of its walls, including the inferior orbital plate, which was removed. A large quantity of offensive pus was discharged from

both the antrum and the orbit. The conjunctiva was involved, so that a collyrium instilled into the conjunctiva flowed freely through the antrum into the nose and throat. In another case occurring in a lad who presented himself with marked swelling of the left upper eyelid and periorbital tissues, there was exophthalmos, the eye being pressed also downward and inward. Orbital abscess was diagnosed, a free incision made and a large quantity of pus evacuated. The wound and abscess-cavity healed, apparently from the bottom, and the periorbital swelling and edema of the lids disappeared. In a week the boy returned with a recurrence of pain and swelling. The wound had reopened and was discharging freely. The relapse proved to be due to the presence of a sequestrum of necrosed bone occupying the outer aspect of the superior orbital ridge, which was removed through the fistulous opening without difficulty and fortunately did not involve the roof of the orbit. The exophthalmos disappeared and the mobility of the globe was perfect. Necrosis of the bony walls is a frequent cause of delayed resolution in cases of orbital abscess. Another fortunate outcome in the case presented is the preservation of the function of the eye. In two instances Dr. Risley has witnessed complete blindness from atrophy of the optic nerve as a sequel to abscess of the orbit. This possibility, therefore, should be considered in giving a prognosis under similar conditions.

DR. C. H. THOMAS said that promptness in operating is the point urged between the lines of the paper all the way through. Ophthalmic surgeons will doubtless be more prompt to operate after this report than otherwise they would have been. It would be interesting to know the means by which the function of the superior oblique has been restored following its reported detachment at the pulley.

PHILADELPHIA'S GAS-SUPPLY IN ITS RELATIONS TO THE  
PUBLIC HEALTH—A COMPARISON OF THE INJURIOUS  
QUALITIES OF COAL-GAS AND WATER-GAS.

LOUIS J. LAUTENBACH, M.D., PH.D.

[Read November 10, 1897.]

I will premise my remarks by reading the resolutions adopted by the College of Physicians in April, 1888, as a result of an investigation by a special committee which had been appointed to report on the subject of water-gas:

"WHEREAS, The College of Physicians of Philadelphia has learned that it is proposed to furnish the citizens of Philadelphia with illuminating gas consisting of two parts of coal-gas and one part of water-gas, a mixture which will probably contain at least thirteen per cent. of carbonic oxid; and

WHEREAS, In the opinion of this College the use of any illuminating gas which contains more than ten per cent. of carbonic oxid would be attended with very great risk to the health and life of the citizens of Philadelphia; therefore be it

*Resolved*, That the Mayor of Philadelphia is hereby petitioned that if in his opinion it be necessary to use water-gas in connection with the illuminating gas, that great care be taken to render it certain that the mixture will at no time contain more than ten per cent. of carbonic oxid."

Illuminating gas has long been one of the necessities of modern life, and it is evident that for various reasons there is more or less danger to health and life from its use. All illuminating gases have connected with them the same elements of danger, but in varying degrees.

The subject has become most interesting to the citizens of Philadelphia because of the efforts, at present being made to lease the City's Gas Works, by a private corporation, which I understand purposes to relinquish the manufacture of coal-gas, and to substitute illuminating or carburetted water-gas in its place. As the composition and method of manufacture may not be known to all, I may say that water-gas is the result of the decomposi-

tion of super-heated steam, breaking up into its component elements in the presence of coke or anthracite coal, burning at an exceedingly high temperature (the process being conducted at a temperature of from 1700° to 2000° F.). This results in the production of carbon monoxid, carbonic acid, marsh-gas, hydrogen, nitrogen, hydrocarbons, with traces of various other gases. The gas thus produced is practically odorless, and while a splendid fuel-gas, has little illuminating power. In order to render it useful as an illuminant, it is passed from the generators to a super-heater in which it meets a spray of highly heated and partially vaporized oil. The oil-vapor and water-gas pass together into a second super-heater (or carburetter as it is usually called), the oil-vapor being converted into fixed gas. The oil-vapor is mixed with the water gas, giving to it an illuminating quality depending upon the quantity of the oil-gases or hydrocarbons taken up in the process. It will readily be seen that the resultant is really a mixture of a large number of gases, the chemic composition varying according to the materials used, the temperature at which the various decompositions occur and a variety of other conditions.

Coal-gas and carburetted water-gas are very much alike in respect to their variability in composition, but to compare the constituents of the two gases, I will quote proportions furnished me by Mr. Edw. H. Earnshaw, the chemist in charge of the United Gas Improvement Co.'s works:

	Coal-Gas.	Water-Gas.
Benzine vapor ( $C_6H_6$ ).....	0.4	0.5
Illuminating hydrocarbons.....	5.0	12.0
Carbon monoxid (CO) .....	8.0	31.0
Hydrogen (H).....	47.0	34.0
Carbon anhydrid ( $CO_2$ ).....	2.0	3.0
Marsh-gas ( $CH_4$ ) .....	36.0	17.0
Nitrogen (N).....	1.6	2.5
Total.....	100.0	100.0

The variations between different specimens of gas are sometimes very considerable. The same authority informed me that in an analysis made at the Drexel Institute recently of the gas furnished there, tests showed the presence of 25 per cent. of nitrogen. There must thus necessarily be a great defect somewhere in the gas-manufacture. Instead of distillation of coal in closed retorts furnishing the gas, there must have been a burning up or destruction of the coal, the nitrogen being due to decomposition of admitted air.

Witthaus gives a slightly different proportion of carbon monoxid, saying: "It is a constituent of coal-gas in from 4 to 7.5 per cent., and of water-gas from 30 to 35 per cent."

As to the relative composition of coal-gas and water-gas, there seem, however, to be a few well-established facts that might be noted here, the most important being that in water-gas there is four times as much and sometimes five or six times as much carbon monoxid as in coal-gas.

The amount of marsh-gas or methane in water-gas is usually one-half as much as in coal-gas, and sometimes less than this. The illuminating hydrocarbons are usually greater in amount than in coal-gas, sometimes twice as great or even more, depending entirely upon the amount and quantity of oils used in the carburetter. The quantity of hydrogen is less in water-gas than in coal-gas. There is likely to be a trace of sulphur, more so in coal-gas than in water-gas.

It must not be forgotten that throughout this paper the water-gas spoken of is the carburetted water-gas used for illuminating purposes, a mixed gas that has a marked benzine tar-like odor, and not the odorless fuel-gas or plain water-gas.

With the purpose of learning something of the effects on the human system of water-gas, I addressed letters to a number of chemists, plumbers, gas-officials, and employes of various gas-works, and received a variety of answers which are more or less contradictory. I then began to look up the subject of water-gas in encyclopedias, text-books of chemistry, and in the numerous pamphlets written on the subject, and found that the encyclopedias and text-books give but little information along the lines desired, and that the

pamphlets were mainly the results of private financial interests, clashing either with public interests or other private money-making corporations, and had to be scanned carefully to get a germ of truth.

I think, however, enough will develop to prove a few propositions that I shall enumerate at once:

1. Both coal-gas and water-gas are dangerous to health and life.

2. There can be no question that the greater proportion of carbon monoxid in water-gas renders it by far the more poisonous of the two.

3. Both gases are explosive and may thus imperil life.

4. Coal-gas, containing marsh-gas in greater quantity, is the more explosive.

5. Both gases, in burning, vitiate the air of the living-room.

6. The gases are much alike in this respect, water-gas burning up less of the oxygen of the room, but producing more carbonic acid gas.

Coal-gas and water-gas are dangerous to health and to life. In sufficient quantity, either of these gases could cause death by exclusion of oxygen; to breathe either gas pure would cause almost instant death, as neither contains oxygen in appreciable amount, and life would cease from its need. If breathed in a diluted form, the heavy hydrocarbons and marsh-gas would act perhaps first as cerebral stimulants, followed by a mild anæsthetic effect, but would be non-toxic, as long before the amount of them would be sufficient, that other constituent, carbon monoxid, would have caused death. The carbon dioxid acts only mechanically, by preventing the ingress of just as much oxygen-carrying air as it displaces; in fact, the other constituents, except the monoxid, will act in the same way, their volume but diluting the air to the extent of their presence.

Despite the foregoing facts, there have been several statements as to the poisonous nature of marsh-gas. Now, it is a well-known fact that coal-miners work for hours in an atmosphere mixed often with large quantities of this gas and do not suffer ill-effects. The argument of Leblance, that "the Davy lamp was invented for the protection of persons (from fire and explosion), living, breathing, and

working in such an atmosphere," must indicate the falsity of such a statement.

Now, coming to the relative effects of the two, it looks as if the difference must depend upon the amount of carbonic oxid contained in each. We shall find our evidence very contradictory. Chemists agree that carbonic oxid is poisonous.

Witthaus says of it: "The actively poisonous character of this gas . . . renders it practically the most dangerous of toxic gases. The number of accidental and suicidal deaths from carbon monoxid now exceeds that of similar poisonings by any other agent. Carbonic monoxid combines chemically with the oxyhemoglobin of the blood to form a compound more stable than oxyhemoglobin, and hence by preventing the absorption of oxygen in the lungs, it produces what may be termed an internal or circulatory asphyxia, and the respiratory function of the hemoglobin so combined is permanently destroyed." Yet, added to a petition sent to the Legislature of Massachusetts in 1888, asking that the law passed there in 1880, at the suggestion of the Gas Inspector, that no gas containing more than 10 per cent. of carbon monoxid should be manufactured in Massachusetts, be repealed, was the following statement, signed by Prof. C. F. Chandler, President of the Health Department of New York, and Professor P. W. Bedford of the College of Pharmacy of New York: "It (water-gas) is no more dangerous to life and health than coal-gas, and there is no just ground, as far as health and life are concerned, to prohibit its manufacture."

Prof. E. Story Hunt of Montreal, in 1884, before the joint standing Committee on Manufactures in Massachusetts, said that, "it is not proved that carbonic oxid is a more noxious or deleterious ingredient in gas than the various hydrocarbons, and I do not think it has been shown that gas containing twice or three times as much carbonic oxid as ordinary coal-gas is really any more dangerous than the ordinary illuminating gas."

In 1878, the Consumer's Gas Company, of Toronto, obtained from Dr. W. H. Pike, Professor of Chemistry in the University College, Toronto, the following statement: "The city gas (water-gas), as at present supplied, is, if used with the ordinary precautions, free from all practi-

cal danger. As to the comparative danger to life if there be an open tap or leak in a bedroom in the case of coal-gas or Lowe gas (water-gas), I think there can be no great difference."

Prof. Henry Wurtz, Gas Chemist of New York, in 1883, gave sworn testimony to the effect that an illuminating gas containing a predominance of carbonic oxid was almost in every respect safer for public use than one in which marsh-gas predominates, and in no respect less safe.

Dr. E. G. Love, Official Gas Examiner of New York, testified in 1883: "I do not consider the presence of carbonic oxid in illuminating gas as objectionable."

Prof. Ira Remsen, of Johns Hopkins University, testified: "I do not consider the use of water-gas at all dangerous if used with the same precautions as are observed in the use of ordinary coal-gas."

Prof. H. H. Croft, of Toronto, testified: "There can be no great difference between coal-gas and water-gas as to danger."

Dr. Joseph Jones, Health-Officer of New Orleans, in a report to the Mayor in 1880, states that "Water-gas is not more dangerous in case of leakage than coal-gas."

Prof. F. B. Wilson, Chemist of Baltimore, testified, "That the Lowe water-gas is less dangerous in case of leakage than gas made from coal."

In 1872, Dr. James Louttit made a report to the British Association of Coal-Gas Managers, of experiments on rabbits conducted with coal-gas and water-gas and concluded that "carbonic-oxid gas in the presence of hydrogen, is, at least, not more poisonous than the carburetted hydrogen gas."

Prof. Alex. Crum Brown, of Edinburgh University, wrote in 1896: "The poisonous action of illuminating gas depends almost entirely on the carbonic oxid which it contains. In the case of leakages into rooms where persons are already asleep, or where people are unaccustomed to the use of gas for lighting purposes, the danger is certainly greater with carbonized water gas than with common coal-gas."

Mr. Robert M. Morse, Jr., in his closing argument before the Massachusetts Committee on Manufactures, in endeavoring to pass a bill repealing the 10 per cent. carbonic oxid bill passed in 1880, stated, "That both water-gas and coal-gas contain elements dangerous to the public health,

if they are breathed. The proportions of these elements differ. That coal-gas is somewhat less dangerous than water-gas if inhaled, I have no question. It will take a little longer for one to be poisoned by coal-gas than by water-gas."

Of the various Philadelphia chemists from whom I have obtained replies, all agree that water-gas is the more dangerous to life and health. I hope, however, they themselves will give you their testimony.

From the plumbers from whom I have received replies, all but one are convinced from their business experience, that their workmen are more easily affected by the present mixed gas than our former coal-gas.

Last year Philadelphia manufactured in all 4,913,461,000 cubic feet of gas, of which 1,916,396,000 was water-gas, supplied by the United Gas Improvement Company, the city gas employees mixing as well as possible the two portions—a little over a third water-gas.

In March, 1888, several hundred physicians of Massachusetts, including a great many medical teachers and examiners such as Wood, Bigelow, Minot, Bowditch, Williams, Hodges, Shattuck, protested against the passage of any law allowing the manufacture of illuminating gas containing more than 10 per cent., of carbonic oxid, as the intensely poisonous properties of that gas are well known, and are dangerous to health and life."

Prof. William T. Sedgwick and William Ripley Nichols, of the Boston Institute of Technology, made in 1885 a report on the subject of water-gas to the State Board of Health, Lunacy and Charity. This report was the result of a series of careful experiments made on lower animals with coal-gas and water-gas. I will quote liberally from this report: "It is generally admitted that while the other ingredients of illuminating gas are not without their physiologic effects, when breathed with air in a mixture of which they form a large proportion, nevertheless the only ingredient possessed of really toxic properties is carbonic oxid."

They further say:—"The conclusions to which our experience has led us are as follows:

"1st. Water-gas is more poisonous than coal-gas.

"2d. The experiments confirm the work

of others in proving that carbonic oxid is not a cumulative poison; that is to say the breathing of certain small quantities for a long time is not equivalent in effect to the breathing of a large quantity for a short time, and this fact has much to do with the difference between the two gases. For an atmosphere containing a small percentage of coal-gas may be breathed for many hours without serious effects, while an atmosphere containing the same amount of water-gas will be injurious and even fatal.

"In order to produce distinctly poisonous effects by means of either coal-gas or water-gas, it is necessary that the carbonic oxid in the mixture of gas and air shall reach a certain amount; and to accomplish this with coal-gas in an ordinary room is a matter of some difficulty, as we have found, before the natural ventilation which is all the time going on through the walls, ceilings, and floors, and through the cracks about the windows and doors, permits of so much diffusion, that this, combined with the moderate amount of carbonic oxid present in the inflowing gas, does not allow the danger-line to be easily reached. If it were not for this fact, accidents from the use of ordinary coal-gas would be much more frequent than they actually are. With water-gas, on the other hand, it is not at all difficult to reach the danger-line; i. e., to obtain, in an ordinary apartment, a dangerous percentage of carbonic oxid. This is not, as some suppose, on account of the somewhat higher specific gravity of water-gas as a whole, for this fact would influence but slightly the diffusion of the dangerous ingredient—carbonic oxid; but rather on account of a larger proportion of the poisonous ingredient which water-gas contains.

"Water-gas is therefore not only in itself more poisonous than coal-gas, but is also far more likely to produce injurious effects from similar accidental causes.

"It must not, however, be inferred that gas containing twice as much carbonic oxid as another is necessarily only twice as dangerous. On the contrary, the danger increases, particularly with certain percentages, very much more rapidly than this.

"Dogs, cats, rabbits, and pigeons do not show any symptoms of poisoning after ex-

posure for many hours to an atmosphere of one per cent. of ordinary coal-gas, being apparently able to resist it almost indefinitely; and in one case animals were exposed for twenty-four hours to an atmosphere containing, the greater part of the time, as much as two per cent. of this gas, without showing symptoms of anything worse than discomfort and drowsiness.

"On the other hand, dogs, cats, rabbits, and pigeons when exposed to an atmosphere containing from one-half to one per cent. of water-gas (with which we have experimented in Middletown, Conn., and Athol, Mass.), have invariably, by the end of an hour and a half, shown serious symptoms of poisoning—such as anxiety, salivation, vomiting, delirium, loss of muscular control, etc.; and death has generally resulted after five to eight hours' exposure to an atmosphere containing not over one per cent.

"If, instead of comparing the effects of the same percentage of the two gases, we consider the time necessary to cause poisoning by the use of the same quantities of gas under the same conditions, we find a contrast not less striking.

"Incidentally we have been enabled to note the primary effects upon man himself, for, while we have frequently entered rooms charged with coal-gas, and, in some cases, have remained comparatively long, the effects have never been more than disagreeable. Oppression and headache have not seldom resulted from entering, in the same way, rooms charged with water-gas; and in one case exposure for a total of one hundred and ten seconds to an atmosphere containing two and a half per cent. of water-gas produced anxiety, trembling, partial loss of muscular control, slight nausea, and an after-headache of the severest character, lasting for several hours."

In one of these experiments of exposure to a given quantity of water-gas, seven animals died within eight hours, whereas eight animals exposed to coal-gas, under precisely similar conditions, were all living after eight hours' exposure, and in twenty-four hours' time two only were dead, six still living.

To learn something of the poisonous nature of carbonic oxid, one need but study the returns of the Paris suicides, by

the burning of charcoal in closed rooms. Their object in closing cracks, doors, etc., is threefold: to avoid interference with their purpose, to produce carbonic oxid by reason of the deficient supply of oxygen furnished to the fire, and to prevent the escape of this poisonous gas, and make death the more quick and sure.

The following figures of the relative number of deaths from inhalation of coal-gas and water-gas have been in part compiled by Dr. Raymond of Brooklyn, and in part by Mr. Charles P. Greenough of Boston.

Deaths from illuminating gas in New York City and Boston:

	Water-gas	Coal-gas
1880.....	14 .....	1
1881.....	18 .....	3
1882.....	22 .....	2
1883.....	24 .....	0
1884.....	19 .....	2
1885.....	18 .....	0
1886.....	35 .....	1
1887.....	27 .....	0
1888, Jan. and Feb..	7 .....	0
Total.....	184	9

During the same period in Boston there were but three deaths, coal-gas only being used there.

Deaths from water-gas in Baltimore:

1883	'84	'85	'86	'87	Total
6 .....	3 ...	14 ...	13 ...	9 .....	45

During this term of years the total output of coal-gas in Boston exceeded the total output of all gas in Baltimore, and yet there were but two deaths in Boston, a city where the houses are more tightly closed up than in Baltimore, on account of the greater severity of the weather. The total number of deaths from coal-gas in Boston is fifty-five since 1823 (to 1888).

Workmen who have been employed by water-gas companies, do not suffer as quickly or as seriously as a tyro, but they seem to realize acutely the added danger to which they are exposed when hunting for or repairing a leak. They observe every precaution and take a man away as soon as he feels the slightest effects. Dr. Edwin A. Down, of Middletown, Conn., relates an interview that he had with a workman, evidently a foreman, who says:

"On several occasions our men have had to be carried out of the ditch. During



the illness of some of the workmen, I was compelled to get into the ditch myself, and after making the opening in the main, I began to feel the effects of the water-gas at once. At first I felt a fullness in the head. Soon I became dizzy and everything about me seemed to be moving. I attempted to call to my helpers, but found it impossible to do so. I recognized my men and knew where I was, but it was not until after I had been conducted out of the ditch, and had been supplied with stimulants, that the power of articulation was restored." This man said that he was not aware of the poisonous nature of the gas until his attention had been directed to it, but he admitted that accidents to his men were more frequent, and the symptoms were more poisonous than those due to coal-gas.

The rapid effect of water-gas on workmen employed in repairing leaks was noticeable in Philadelphia as early as 1876, when the first water-gas plant was established in that city (at Manayunk). The workmen would seem to suddenly go crazy and become maniacal and have to be dragged to the surface, and given fresh air at once. It was, I presume, of this Manayunk plant that the Hon. Rob't M. Morse, Jr., counsel of the water-gas companies, seeking entrance into Boston, spoke as follows:

"There is not an instance in which the Lowe process once adopted has been abandoned, except in Philadelphia, where the works are owned by the city, and the business is managed by the politicians, and the results of the adoption of the Lowe process was such a reduction in the amount of labor employed, one hundred men being sufficient, under the new system, to do what required two thousand or so under the old method, that the politicians could not stand the pressure from those who lost or were liable to lose their places, and so went back to the old way."

Despite this convincing evidence and the absolute proof of the fact itself, of a poison increasing in its severity of action and rapidity as the dose is increased, provided, of course, the dose be less than lethal, there are some well-informed officials connected with our gas-companies, who do not seem to admit its truth.

Mr. Samtel T. Bodine, General Manager of the United Gas Improvement

Company, has been interviewed within the past two weeks, and says that "water-gas is not any more poisonous to life and health than coal-gas," and also that "it has not caused any more deaths (for equal quantities of gas consumed)."

Mr. William K. Park, Chief of the Bureau of Gas of Philadelphia, endorsed Mr. Bodine's words and added that in case of death from these gases, the period required to produce the result would not vary as much as a quarter of a minute. This statement is made in spite of all testimony and all common-sense reasoning to the contrary, for if true, it would indicate that oxygen is not a necessity in the aeration of the blood, that life could exist without oxygen.

Does it seem plausible that the atmosphere of a room is vitiated to the same extent by an equal volume of coal-gas as of water-gas, one containing four times as much carbon monoxid as the other? Does it seem possible that the effects are equal in rapidity of action and in severity? If so, let us carry our lines of reasoning a little farther. Suppose we should discharge into the room, not six feet of gas containing two cubic feet of carbonic oxid, but a like quantity of pure carbonic oxid, by the same reasoning our results must be the same, if the two feet of the oxid in water-gas have no more effect than the one-half foot in coal-gas, the six cubic feet cannot have any more effect. The proposition is so absurd that it really needs no consideration, and yet it has been so befogged by paid and interested testimony, that it has seemed to demand more consideration than any other branch of the subject.

Both gases are explosive and may thus imperil life, mainly by reason of the marsh-gas, which is present in quite considerable quantities in both gases, but in much greater quantity in coal-gas than in water-gas, and the explosiveness of the two gases is approximately proportioned to the amount of methane contained in each.

Both gases vitiate the air of the room in which they are burned. In other words they rob the air of oxygen, and fill it with products of decomposition, deleterious to health and life mainly by occupying a space that otherwise would be occupied by the oxygenated air. From the table

here appended, kindly worked out for me by Mr. Edw. H. Earnshaw, it will be observed that every hundred volumes of coal-gas consumed requires 121.25 volumes of oxygen, whereas for a hundred volumes of water-gas but 114.25 volumes are necessary, while the products of combustion of carbon dioxide are less, and water-vapor produced is greater. Reckoning the consumption of oxygen as per candle-power, assuming the one to be 16 candle-power, the other 25 candle-power, it will be observed that the amount of oxygen required is greater, and the amount of carbon dioxide and water produced is greater in the case of coal-gas than that of water-gas.

Edw. H. Earnshaw's table:

COAL-GAS	(CO <sub>2</sub> )	(H <sub>2</sub> O)	(O.)
Benzine-vapor... 0.4	2.4	1.2	3.0
Hydrocarbons... 5.0	12.5	12.5	18.75
CO..... 8.	8.		4.
H..... 47.		70.5	23.5
C H <sub>4</sub> ..... 36.	36.	72.	72.
CO <sub>2</sub> ..... 2.	2.		
N..... 1.6			
<b>Total Volume 100.0</b>	<b>60.9</b>	<b>156.20</b>	<b>121.25</b>
Per c. p. illuminating power 16 c. p.....	4.	10.	7.5
<b>WATER GAS</b>			
Benzine-vapor... 0.5	3.0	1.5	3.75
Hydrocarbons... 12.0	30.	30.	45.
CO..... 31.	31.		15.50
H..... 34.		57.	17.
C H <sub>4</sub> ..... 17.	17.	34.	34.
CO <sub>2</sub> ..... 3.	3.		
N..... 2.5			
<b>Total Volume 100.0</b>	<b>84.</b>	<b>122.5</b>	<b>115.25</b>
Per c. p. illuminating power=25 c. p.....	3.	5.	5.

For the same illumination the products of combustion from 16 c. p. coal-gas as compared with 25 c. p. water-gas would be

CO <sub>2</sub> .....	½ more
H <sub>2</sub> O.....	double
O.....	½ more

These conclusions seem to accord with those of several other chemists. In connection with this Dr. Benj. Silliman, Professor of Chemistry at Yale College, wrote in 1869: "In entire variance with popular belief our analyses prove that a compound hydrocarbon gas (water-gas) consumes much less atmospheric oxygen, and vitiates a given volume of air to a much less degree than an ordinary gas of equal illuminating power."

Having, I hope so presented the subject that it is evident that water-gas in its

effects on the system is much more dangerous than coal-gas, it is now necessary to study how its dangers are avoidable. Cases of suicide and of gross ignorance it is almost impossible to avoid, but there are numerous cases of accidental deaths. According to Witthaus "nearly one-half of the accidental poisonings in New York City in 1889—1892 were by illuminating gas and the same agent was used by suicides more frequently than any other poison, except Paris green and rat poison."

Accidental deaths occur mainly because of breaks in the pipes or mains or leakages about the fixtures. In Philadelphia this last year there were three deaths in one family occasioned by a leak in a pipe in a house on Darien street, and in last Sunday's papers there was a note of five deaths occurring from gas escaping into a house in Lansford, Pa.

More attention will have to be paid to the street mains, to the gas-pipes within doors, and also to the fixtures, if this gas is introduced in Philadelphia, and there is every reason to believe it will be, if not by a private corporation, then by the city, its economy of manufacture almost necessitating such a change. You will remember doubtless, that the water-gas company is well satisfied at present to sell the city its water-gas at 37 cents a thousand cubic feet, and I am informed that they are able to manufacture it at a rate little if at all beyond 18 cents per thousand cubic feet. The economy of manufacture is, I believe, due to the small amount of labor required; as before said, the labor of 2,000 men is displaced by that of about 100. In this connection, a fact that has come to my notice within a few days may be interesting. In Cincinnati the Private Coal Gas Company received sufficient money from its residual and by-products, coke, etc., so that its coal-gas, which it sells to the community, is practically profit.

If the city is going to use water-gas as its illuminant, it will be necessary to at once tear up its mains and lay them anew on a more comprehensive plan. They are nearly all too small and inefficient on account, not only of their patchwork construction but also on account of their age, with its attendant rusting and clogging from deposits. The faulty construction

of our distribution, with the rusting within the main, and the clogging from the condensation of the hydrocarbons, naphthalin, etc., requires that the pressure to force the gas out through the mains be much increased, and instead of using from  $\frac{3}{4}$  in. to  $1\frac{1}{2}$  in. pressure, I understand the pressure is frequently as high as 5 inches. This great pressure causes increased friction, with the deposition of more of the hydrocarbons. In addition it causes a great escape of gas at points of leakage and forces within the house-pipes, and at gas-fixtures the gas through openings that otherwise would not allow of the escape of the gas. At times of the day when gas is being little used this pressure is often greater and gas will escape at such times into a house and not at other times when more is in use. This would indicate that the gas should be turned off at the lower end of the service pipe, or at the meter when not in use. The dangers and discomforts of our method of distribution will be much increased by the introduction of water-gas, as in order to distribute it with the present mains the same pressure must be used as at present and the illuminating virtues of the water-gas will be decreased in the same proportion as our coal-gas is now reduced (from 16 c. p. to about 12 c. p.); and in consequence instead of a light of 25 c. p., as should be obtained, we will practically get but from 16 to 20 c. p. Danger to life and health will be much increased by the extra quantity of carbon monoxid that will escape into the house from any leaks or openings that may exist; this danger will be increased as we have seen at least four or five-fold.

In the Mayor's report for 1896, attention is called to a 3-in. main which was extended, and from the point of extension, became a 6-in. main, and later an 8-in. main was added to this. The method of distribution, as well as the choking up of the pipes by rust, naphthalin, etc., and perhaps numerous leaks and ever-open pipes are in the main responsible for the loss to the city, last year of about 23 per cent. (1,132,646,138 cubic feet) of the total production (4,913,431,000 cubic feet) of gas, whereas the public companies of England average 9 per cent. loss, and the private corporations about 9.1 per cent. loss.

It must be evident that outside of the

money-loss to the city, this enormous amount of gas lost must prove a detriment to health in the localities where its escape occurs. No doubt we all know of several parts of our city which have the gas odor, such as has been observable on the Walnut street front of Dr. Willard's house for over six months past.

In connection with this matter I wish to read a letter from one of Philadelphia's most experienced plumbers, which he has written, intending to send to Mayor Warwick:

"As a citizen, some while ago I felt much pleased, when the municipality reduced the price of gas from \$1.50 to \$1.00 per 1000 feet, as it was a step in the right direction, provided the quality of gas was maintained.

"Now, I have had over forty-two years' experience as a plumber, and it is from that, as well as facts which have lately been forced upon my attention, that I feel it my duty to write you.

"Within six months after the dollar gas was inaugurated, I began to hear complaints from my customers and friends about the poor quality of the gas, but, as you know, complaints of this kind are not unusual, and I cannot say that I was much impressed by them at the time. But the complaints of want of light or illuminating power of the gas, seemed to be continually on the increase, so that in many cases I have made personal examination of the pipes to find the cause. In many cases I have found that the pipes are almost entirely clogged up with rust or fine deposit from the gas. The remedy is, of course, to blow them out, which permits the gas to flow freely through them until the rust or deposit again accumulates, which does not take more than three months. This, of course, is not pleasant for tenants and owners to have done continually, aside from the question of expense, but when I say to you, that I now have three men, and at times as many as six, who do very little else but blow out pipes, and that every plumber, who is in active business, whom I have spoken to upon the subject, is now undergoing an experience similar to mine, you can begin to appreciate its magnitude. The necessity for blowing out gas-pipes has always existed, and probably always will, but for one pipe that needed blowing out six

years ago, there exist now fifty, where light can hardly be obtained without it. The cause, I think, must be in the quality of the gas itself, or its manufacture. There is also another aspect of the question which to my mind is serious, and that is, many of the distributing pipes throughout dwelling houses seem to be so corroded and affected, that they are unsafe. I lately investigated a large house on West Walnut street, and the pipes were so affected that I abandoned them and substituted new ones. I assume that you will agree with me that a gas-pipe in that condition is very dangerous. I have kept a sample of this pipe, and should be glad to submit it to you for examination, should you desire to see it. If this were an isolated case, I should not regard it so important, but I regret to state that it is only one of a number. It seems to me that this subject is a matter that should be thoroughly investigated by competent men, and a remedy found. I trust you will not view me as an alarmist, nor as one interested in any way in gas or its manufacture, because I am not; but it seems to me possible, although I, of course do not assert it as a fact, that the origin of some of our late fires, about which there is so much obscurity, might be the result of a corroded gas-pipe worn through, such as I found on property No. 1219 Arch street. There is also another phase of the question, about which I hardly care to hazard an opinion, and which may also be a factor in the corroding of pipes, and that is electricity. We now use it for telegraph, telephone, lighting, and most important of all the trolley, which uses it in great quantities. Some of it must escape, and it would naturally go into the ground. There must be some waste electricity in our public streets, with so much of it about. Who can say what effect it has upon our water-pipes and gas-pipes? I cannot, because I do not know positively. But I believe there is an element of danger unless gas-pipes are examined from time to time and kept in good condition. I might add in conclusion, that the house that I have spoken of as an illustration was originally first class, and I have no doubt that when the pipe was put in expense was not considered. If that first-class pipe could not withstand the action of the present gas, how much less so would pipes in many of

our new and smaller dwellings, where the very cheapest plumbing exists. I can show you pieces of pipe obtained from both houses mentioned in the letter, and think them most interesting specimens as showing the process going on in our own houses, perhaps even now as bad or worse."

\* \* \* \* \*

One point that I have neglected has been the physical effects of the poor illuminating power of the gas. Here in Philadelphia we suffer from diminution in its lighting qualities. The friction due to the great pressure required and the passing through long, inefficient and closed-up mains and pipes causes a condensation of the heavy hydrocarbons, the illuminants, and thus our gas is robbed of its light-giving qualities. If we were to introduce water-gas in place of coal-gas, there would be no difficulty in raising the candle-power from 16 to 25 or even 28 c. p., provided our pipes were in good condition. This low candle-power of our gas must necessarily exert a decided influence upon the health and comfortable use of the eyes of our inhabitants, and must needs increase the labors and profits as well of the oculist and optician, not to speak of the family physician and neurologist, who are often called to diagnose the nature of obscure head-symptoms so occasioned.

Our Mayor's remarks in his annual report for 1896 on the subject of Philadelphia's gas will bear repetition here, as, should his suggestions be followed, we will obtain a better and safer illuminant at less cost, and will still own and manage our own gas-plant, and will feel that if a reduction from \$2.30 per thousand cubic feet in 1875 to \$1.00 in 1893 was possible under the old order, an even greater proportionate reduction will be made in the future.

I will quote from this report:

"The gas manufactured by the Philadelphia Gas Works is equal in quality with that made in any city of the Union. In other words, the gas in the holder before distribution is a good illuminant of the necessary candle-power, but unfortunately, by means of our method of distribution, when it reaches the consumer it has lost much of its illuminating quality. This is not due to any fault of the gas itself,

but the inefficient and insufficient methods of distribution. The gas has to be forced by great pressure through many miles of small-sized or inadequate mains, and by reason of this great pressure the candle-power is necessarily reduced because of the excessive friction to which the gas is subjected; it is thereby robbed of the hydrocarbon, which is its light-giving quality. The matter of distribution should be taken up and considered with the greatest of care, and perhaps it would be advisable under all the circumstances to have an estimate made of the cost that would be involved in effecting the desired changes. Plans should be drawn showing the location, the capacity and the life of the mains, in order that this work may be done systematically and economically. For instance, in one section of the city leading from the gas-works to supply a certain locality, years ago, a three-inch main was laid, which was in that day considered of sufficient size and capacity, but as population increased and passed beyond the limit of the original calculation it was necessary to further extend the main and a six-inch main was added, and subsequently to supply the still growing demand, an eight-inch main was laid; thus we have three different-sized mains joining each other and used for the purpose of distrib-

uting the gas, when in truth and in fact a 20-inch main for the proper distribution of gas in that locality is absolutely required. The fault does not lie in the manufacture of our gas, which is produced from the best coal that can be purchased for the purpose and the application of scientific methods, but in the inadequate and insufficient means of distribution, and until better methods be adopted there can be little if any improvement.

"The gas-works are a most valuable asset and should never pass from the absolute control of the city. The plant is valued at about \$30,000,000—close to the actual debt of the city at this time, and money will be well expended if the changes suggested are carried out."

From the facts that have called forth the foregoing remarks, I have reached these conclusions:

That both water-gas and coal-gas are dangerous to life and health. Water-gas, however, being by far the more poisonous when inhaled, greater care must be exercised in its use; consequently should water-gas be adopted as an illuminant in our city an entire readjustment of the method of gas-distribution would be necessitated, and also a thorough inspection and reparation of the pipes and fixtures in all individual houses.

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## DISCUSSION.

DR. J. F. HOLT stated that he had expected to hear a discussion of the subject of the effects of coal-gas and water-gas on the eyes and general health of people. He had listened very attentively to the paper on the following points, viz.: to prove that carbonic acid is a poisonous substance, more poisonous than many other gases. In using illuminating gas it is not in a physiologic sense to see how quickly it will kill. There is no desire to put people in a room and turn on the gas and see how long they will live in it. Such an experiment is performed sometimes on animals in the physiologic laboratory, in order to learn which will be the more deadly, carbonic oxid or other gases. Mainly, however, these gases are

used for lighting purposes, that is, they are burned. Nobody doubts that carbonic oxid is a poisonous substance, and quite a number of other gases are also injurious. One will kill quicker than another unburned; but that is not the point. The point to be brought out is are the products of combustion injurious to the eyes or the general health. A set of lights made from one of the gases and a set of lights made from another will yield carbonic acid, but it is fair to ask what is the difference between one and the other. If either coal-gas or water-gas escapes in a house, the odor at once becomes apparent, a plumber is called and the leak is repaired.

## THE USE OF ELECTROLYSIS AND THE GALVANO-CAUTERY IN THE TREATMENT OF DISEASES OF THE NOSE AND THROAT

PHILIPP FISCHER, M.D.

Among the most valuable therapeutic measures used in the treatment of diseased conditions of the nasal cavity, pharynx and larynx, the electric current in its various forms occupies a very prominent place. The electrolytic and the galvano-caustic power of the current are the two most commonly used at present, and it is to them that I shall give especial attention in this paper. Electrolysis and the galvano-cautery have been employed occasionally in the treatment of diseases of the throat and nose with more or less success by prominent men in this special line of work for many years, but recent publications and the *Transactions* of special societies show the employment or non-employment of these methods to be, so to speak, a question of the day among rhinologists and laryngologists. Most distinguished names are found among the advocates of these methods, but there are perhaps just as many and just as distinguished names in the line of opposition. Furthermore, the improvements in the construction of batteries and accessories, and particularly the reduction in their cost, bring these instruments within the reach of general practitioners, so that their employment by the latter is growing more and more popular, in fact more so than is entirely desirable in the interest of the patient.

I have been using electrolysis and the galvano-cautery in the treatment of the nose and throat for the last six or seven years, and in quite a number of cases I have been able to follow the results for some years after the treatment had been discontinued. In this communication I shall present the results of my observations in that direction, and shall call attention to some points of interest relating to the subject.

Electrolysis has been used, in the first place, in cases in which more or less large masses of heterogeneous tissue have been found to occupy the vault of the pharynx.

Such collections generally close up the entrance to the choanæ and spread into the nostrils, producing here very considerable obstruction. Cases of this kind are not numerous, and therefore reports of real value can be expected only from men with very large experience in treating diseases of the nose and throat. In June, 1895, Dr. J. Solis-Cohen presented a paper to the Philadelphia County Medical Society entitled "Electrolysis in Rhinopharyngeal Growths," expressing his views upon this subject based upon an experience of more than a quarter of a century. Conformably with other authors, Dr. Cohen considers the use of electrolysis in the treatment of the condition named as a therapeutic measure of great value, and as the only method of treatment in otherwise inoperable cases. I have had an opportunity of seeing and studying for quite a while a patient with a large tumor in the nasopharynx treated by Dr. A. W. Watson at the Philadelphia Polyclinic and a full history of which will be published by him in due time. I am, however, permitted to state that in this case, too, electrolysis has proved to be the only treatment that has proved of real value. It reduced the size of the tumor progressively while the patient was under treatment and when he was compelled to leave the city for about ten months it was found on his return that the absorption of the tumor inaugurated by the electrolysis, continued during this time to a noticeable degree.

Another class of cases in which electrolysis has been used exhibit frequently thickenings and deviations of the septum and particularly combinations of both. There is no question, to my mind, that when there is a spur on the septum, producing obstruction in the nasal chambers and all the consequent annoying symptoms, the best way to get rid of it is to remove it by means of a saw. Likewise there can be no question that the best way

to treat a deviation of the septum is by straightening it by one or other of the available methods. This is a radical kind of treatment, and from a theoretic point of view has no equal; it also yields very good results practically in a large number of cases. There are, however, cases in which for one or another reason the employment of either of these methods is impossible or undesirable. In the first place this is particularly the case when complicated combinations of both spur and deviation are present, and in the great majority of cases of this kind it can be predicted at the outset that the results to be obtained from the employment of the radical methods mentioned are more than problematic. On the other hand there is also a very considerable number of what might be called mild cases, in which the saw, the knife and forceps would be just in place, but in which none of them could be made use of for the reason that the patient objects, having an aversion to any bloody operation whatever. It is of great advantage, for this class of cases particularly, and for those already named as well, to possess a method that although perhaps inferior to the cutting operations is, nevertheless, far superior to the swabbing and dusting procedures frequently used, and often yields good results and here and there complete satisfaction. Such a method is found in the use of electrolysis. By means of this, making use of a bipolar electrode, we are able to remove small spurs and to reduce considerably the size of large ones; we are also able to level one or more thickenings on a deviated septum on one or both sides. In all cases of this kind we gain more space for breathing purposes, and this is just the object sought by the patient. This gain in breathing space is not a temporary one, as is usually the result of the minor procedures, but a permanent one and the patient is perfectly satisfied. I have treated a number of cases in that way and a most striking one was under my care quite recently.

Mr. W., aged 39, had been suffering for a number of years from dryness of the throat. He complained also of the nose being stopped up more or less all the time, but most severely when in bed. On awaking at night he would always find himself breathing through the mouth. Some three

years ago he was advised by his family physician to consult a specialist, but according to the patient's statement he was treated by the physician regularly twice a week for over two years, with two free intervals of about four months each in the summer. The treatment consisted mainly in applications of: First, a solution of cocaine, and later some iodine solution to both nasal chambers. This would give him some relief for a short time, but the old condition would soon return. When I first saw the man he considered himself in as bad condition as ever. Upon examination I found that the cause of the trouble was in the septum, which was deviated to the left in its upper part and to the right in its lower part. There was considerable thickening on the convex spots on both sides. The patient objected to any kind of bloody operation and I tried electrolysis. He was under my care for about seven or eight weeks, during which time electrolysis was applied six times. The breathing became much easier generally and also at night, and the feeling of dryness in the throat considerably subsided. I then advised the patient to suspend the treatment for awhile, and let me see how the conditions would be in a few weeks. I saw him again after about three months, when he came to consult me about his wife, and in response to my inquiries he stated that he had been feeling more comfortable than ever. On examination I found the breathing space if changed in any way to be somewhat more roomy than at the time treatment was stopped.

I shall pass now to the subject of the galvano-cautery. In the nasal chambers the galvano-cautery has been applied mainly to the turbinated bodies, in the first place to the inferior. In cases of hypertrophy of the inferior turbinate we have, in the great majority of cases, to deal with hypertrophy of the soft tissues that cover the turbinated bone. The treatment for this condition consists in the local application of different variations of solutions of iodine, in cauterization with perles of chromic acid and of later years in cauterizations with trichloroacetic acid. There is, however, hardly any diversity of opinion among rhinologists in relation to the fact that far better results can be obtained with the aid of the



galvano-cautery. The advantage of the galvano-cautery is, in the first place, that we can make the application superficially or we can penetrate into the tissues as deeply as we find it necessary in the given case. Secondly, we can localize our application to just that point at which we want it and not have it diffused over a larger area, as is generally the case when we use acids. The cauterization is always followed by more or less inflammatory reaction and the formation of an eschar. I have repeatedly been able to trace the cause of a synechia in the nasal chamber to such an eschar, and for this reason I consider it of great importance in using the galvano-cautery point or the so-called knife to select for the application a point or a line that is not liable to come in close contact with the septum. By making the necessary application on the inferior or on the frontal border of the turbinal I am sure a synechia can be avoided. In cases of hypertrophy of the middle turbinated body the conditions present quite a different character. Here we find the hypertrophy confined in most instances to the bony part and the reduction of the redundancy is best effected by means of the snare. Should it be found, however, that the cause of the hypertrophy is in the mucous membrane, then of course an application of the galvano-cautery would be indicated.

Passing now to the indication for the use of the galvano-cautery in the pharyngeal cavity we need to mention but briefly the benefit to be derived from its employment in cases of so-called granular or follicular pharyngitis, and in cases of venous congestion. The destruction of the inflamed follicles and the obliteration of varicose veins in the mucous membrane of the posterior wall of the pharynx by means of the galvano-cautery are procedures too well known to be dwelt upon in the limited space of this paper. The great benefit to be derived from using the cautery in different pathologic conditions at the base of the tongue I have discussed in another paper. There is also apparently no diversity of opinion about the advisability of applying the cautery to the tonsils in cases of mycosis and other pathologic conditions in the lacunæ.

A subject of very great interest at the present time is the question of excision

of the faucial tonsils by means of the galvano-cautery snare. Up to the present we find here and there announcements of improvements made in the construction of tonsillotomes and of different new kinds of scissors devised for the same purpose, and it seems as if some operators are perfectly satisfied with the removal of the tonsils by these means. The literature of recent years shows, however, that there is undoubtedly a tendency among a great number of laryngologists to set aside these bloody operations and substitute for them the galvano-cautery snare. For the last four or five years, during which time I have been connected with Dr. Watson's department in laryngology at the Philadelphia Polyclinic, the tonsillotome has been used exclusively, and I must state that in the vast number of cases operated on by Dr. Watson and by others, in not a single one have any bad consequences occurred, and the conclusion can be justly drawn that in skilful hands the results of operation with this instrument are very satisfactory. On the other hand I have during the same years used in my private practice the galvano-cautery snare exclusively, and the results obtained have in every instance been of a most satisfactory character. The oldest patient on whom I operated with the snare was about forty years and the youngest eleven years old. In the beginning I always used to extirpate only one tonsil at a time from a fear of causing much pain, until on one occasion I had to operate on a very capricious young boy, twelve years old. The operation required quite a good deal of time and persuasion on my part as well as on the part of the parents to get the boy's consent. I removed the right tonsil with very little inconvenience to the patient and was talking to the parents about the advisability of removing the other in a week or so. The father, however, knowing his boy well, suggested that I try to remove the other tonsil also at once, because if the boy should suffer any inconvenience whatever it would be impossible to get him to submit again. I removed the left tonsil also, and to my surprise the pain during the next few days was less than in any case I had previously operated on. Since that time, when necessary, I have always removed both tonsils at one sitting, and so far have never had any oc-

casion to regret such action. For local anesthesia I have used a ten per cent. solution of cocain. For the last seven years I have used the so-called single-cell cautery-battery made by Flemming and also the handle of the same maker, with the irido-platinum wire attached. During recent years the storage-battery has been most frequently used, but as the ideal storage-battery does not seem to have been invented yet I think that at present one kind of battery gives as much satisfaction as another. The ultimate results here, as in other branches of surgery, depend not so much upon the instruments used as upon the character of the case and the skill and experience of the operator. The question now naturally arises: Is there any advantage in using the galvano-cautery snare instead of the tonsillotome? In answering this question it is well to remember, in the first place, that at all times it should be the endeavor of the surgeon to perform operations with as little loss of blood as possible, and a considerable advance has been made in this direction from the time when the elastic bandage—as simple as it is ingenious—was introduced into general use by Esmarch. Not having to keep in mind the possibility of fatal hemorrhage or serious shock from great loss of blood the surgeon undertakes a good many operations to-day in cases in which he would or could not have done so before. On the other hand, a good many patients more readily submit to operations when they can be positively promised that the loss of blood will amount to nothing. A great many patients suffering from the effects of large faucial tonsils do not submit to their removal with the tonsillotome only from a fear of serious hemorrhage. In the use of the galvano-cautery snare we have a method with which it is possible to assure the patient that no bleeding after the operation will follow, and this is a very great encouragement to him. That this also is a source of great relief to the mind of the operator it is hardly necessary to mention.

It has been brought forward as an argument against the use of the snare that it is not possible to perform the operation so quickly as with the tonsillotome. In

my experience this is not the case. On two occasions, when I had a friend present during the operation, we found that, from the time that the snare was in position until the tonsil was out of the patient's mouth, there had elapsed in one case thirty seconds and in the other less than forty seconds; and I feel sure that in other cases it took less time than that. In a recent paper published in the *Laryngoscope*, Dr. Gibb has pointed out different types and groups of enlarged tonsils and has expressed his views as to when the snare could be used with advantage and when the tonsillotome is to be preferred. In my opinion the galvano-cautery snare could be used in all cases in which the tonsillotome can be applied. I have not had the opportunity of operating with the snare on subjects under eleven years of age for the reason that I have not had a case under that age in which the operation could be performed without general anesthesia.

It is only natural that those skilful operators that have been successfully operating on children with tonsillotome for ten, fifteen, or twenty years hesitate to adopt new methods; nevertheless I have reason to believe that under proper general anesthesia also in children the use of the galvano-cautery snare would prove of great advantage, as it is already reported by those that have used it. The employment of electrolysis and the galvano-cautery in the treatment of diseases of the nose and throat is just as much to be studied and intelligently practised as similar employment in other branches of medical work. The great success obtained with the tonsillotome on the one hand and the great harm that has been and is being done occasionally with electricity on the other hand do not prove anything against the latter. They confirm only the fact that the inventors and possessors of the largest number of new instruments are not always the best operators. In the hands of a skilful and thinking operator the old kind of instruments will almost always yield better results than the newest kinds of instruments in the hands of unskilful and automatically working men depending altogether upon their good instruments.

## DISCUSSION.

DR. ARTHUR W. WATSON said that those who advocate the use of electricity as a therapeutic measure are likely to consider it applicable to almost every condition. Dr. Watson has had but little experience with the bipolar method in the removal of spurs and deviations. He has used electrolysis in the reduction of fibromata of the nose and naso-pharynx, with good results and several cases have been published recently, by other observers, in which electrolysis has been successfully employed for the same condition. The procedure is thus a good one when the growths are difficult to remove and liable to return. From a limited experience Dr. Watson is led to believe that the galvano-cautery snare does not possess any particular advantage except in hemorrhagic cases. It seems hardly possible in the majority of cases to so adjust the wire as to remove all the tissue desired. The object should be to remove as much of the tonsillar tissue as possible and particularly that portion which is concealed behind the half arches. In cases in which the tonsil is free and projecting into the pharynx the cautery might be used with advantage.

DR. JOS. S. GIBB said that he had had very little experience in the treatment of nasopharyngeal growths by electrolysis, but a far greater experience in the removal of hypertrophied tonsils by the galvano-cautery snare. He did not think that the latter method would supersede the old method of tonsillotomy, which he considered the best, especially in children. In adults, however, particularly when hemorrhage is to be feared, the galvano-cautery certainly has a place and is to be preferred, as also in a class of cases in children with tonsils that are not only hypertrophied, but attached to the pillars. It is recommended in doing tonsillotomy to always separate the pillars from the face of tonsils, but this is not always easily done. The cautery will cut through the tonsil and the pillar itself without a particle of hemorrhage. The danger of tonsillotomy when the tonsils are attached to the pillar is thus avoided. When the parents or the child objects strenuously to the knife, by thoroughly cocaineizing the part, the wire could be thrown around it and the tonsil removed with very little pain. In cases of this kind the galvano-cautery wire could be used with great advantage.

DR. G. BETTON MASSEY said that he had very little experience with the electro-therapeutics of the throat and none at all with bipolar puncture as contrasted with monopolar puncture. He felt sure that bipolar puncture would be less painful than monopolar puncture, at least he had been told so by Dr. J. Solis-Cohen, who has used both forms of puncture. Dr. Massey has had considerable experience, however, with that

form of electrolysis which might be called cataphoresis, a single positive pole being placed in contact with the mucous membrane. This pole consists of a very small wire electrode about six inches long with a curved point, which should be of either gold or platinum. The one Dr. Massey uses is tipped with a tiny shepherd's crook of platinum about half an inch long and an eighth of an inch wide across the crook; a little pledget of cotton is wound upon this and it is dipped in 5 per cent. solution of cocaine and placed on a sensitive spot in some portion of the mucous membrane of the nose and a current of from 2 to 7 milliamperes turned on. The effect of the cocaine is much intensified through its cataphoric transference by the current, so that one can easily carry the current higher than 7 milliamperes shortly after it is turned on, say about 10 minutes afterward. This procedure enables one to apply the cataphoric effect of the cocaine and of free oxygen and chlorine formed at that spot to any portion of the mucous membrane of the nose, and the immediate effect is rather agreeable. Of course the cocaine helps to open the nasal passage, but the application dries up secretions after the immediate excitation and if applied daily, will do a great deal toward curing the raw condition of the mucous membrane present in the nose in these cases. Such an application is designed altogether from the point of view that these are cases of catarrhal enlargement of the mucous membrane and not isolated hypertrophies or morbid growths, and on the whole the treatment should be preferable to that by various applications of medicated liquids. Dr. Massey's statements were based upon personal experience in his own case. He had some three other cases in which this method was tried and proved highly successful.

DR. L. J. LAUTENBACH said that at the meeting of the Otological Section of the American Medical Association recently held at Philadelphia the consensus of opinion with regard to operations upon the tonsils was that there is but one result to be obtained by any method, whether the tonsillotome, the snare, excision, the cautery, and that is to get down to the circumscribed area and remove the part. No operation will succeed that does not remove all of the tonsillar tissue. It may not be feasible to do this at once, but treatment should be persisted in until this end has been attained. It is especially in small children that this expedient of absolute removal of the tonsil should be adopted. The ordinary mode of procedure is first to cut out all of the tonsil that can be removed, then to use the cautery if necessary and to tear or gouge out with the finger all that was not removed by the other measures employed.

DR. FISCHELIS said that, as a rule, when patients come with the intention of having their tonsils removed, they expect to get rid of them at once and no reputable laryngologist will tell his patient, "after I took out your tonsils you will have to continue to come to me for a good while before you can be considered to be free of them." With the snare a great deal more can be removed

than with the tonsillotome. In one case in which the tonsils were thus removed, six years ago there has been no return.

DR. L. JURIST asked whether complete removal of all the tonsillar tissue is necessary or expedient.

DR. FISCHELIS expressed the opinion that the tonsils should be removed entirely.

## THE DIFFERENTIAL DIAGNOSIS OF ULCERATIVE DISEASES OF THE PHARYNX AND THE LARYNX.

JOSEPH N. GIBB, M.D.

[Read November 10, 1897.]

Diseases attended with ulceration and loss of tissue in the upper respiratory tract are productive of serious and often fatal results. Aside from malignant disease, there is danger in this locality from encroachment upon the lumen of the air-passages.

The onset of the few diseases capable of producing ulceration of the tissues of the pharynx and larynx is much the same. Should the disease-process begin in the pharynx, the initial symptoms will be pain, or soreness of the throat, and interference with one of its functions, of deglutition. Should the process begin in the larynx, pain again will likely be the first symptom and again interference with the function of the part—the voice—and consequently hoarseness. Inspection at this early stage would reveal a localized inflammatory process; hyperemia, tumefaction and impairment of mobility. It is seldom, however, that a case presents at so early a stage.

The diagnosis is almost impossible until a case is under observation for awhile and the character of the growth, the rapidity of its breaking down, the tendency to ulceration and other features are carefully noted.

Let us consider briefly the clinical picture presented in each of the various diseases attended with ulceration and then, if possible, emphasize those points most distinctive of each. Syphilis is perhaps the most common. This disease is peculiarly prone to attack mucous surfaces, and the locality under consideration offers

no exception to the rule. We are not concerned with the superficial ulceration—the mucous patches and plaques which are all too common and present few diagnostic difficulties.

The gummy tumor is by all authorities regarded as the precursor of the deep ulcers of syphilis. It makes its appearance in the pharynx and larynx as a reddish mass, very soon becoming grayish in the center and slightly elevated above the surrounding tissues. The intense redness of the mass shades into a fainter hyperemia of the surrounding tissues.

In the larger number of instances a very brief period intervenes between the appearance of the gummy tumor and its breaking down and ulceration. It is thus quite seldom that we are called upon to make a differential diagnosis at the stage of infiltration or tumor. Instances are upon record in which the appearance of the gummatous mass, its breaking down and the destruction of a large portion of the soft palate have occurred in the brief period of two weeks.

In the pharynx the most common site of ulceration is the postero-lateral walls. The process spreads rapidly to the soft palate and uvula, or the initial point may be the soft palate with extension towards the lateral walls. The tonsils also form a common site.

Gummy tumors and the ulceration succeeding them show little tendency to invade other tissues than those originally involved, *e. g.*, pharyngeal ulceration rarely extends to the naso-pharynx and never

to the larynx. Laryngeal ulceration never extends to the pharynx.

It is true that we may, and frequently do, have separate involvement of the respiratory tract, *e. g.*, the nares and pharynx or nares and larynx. The point at issue is that we do not have an extension of the ulcerative process by contiguity of tissue. This peculiarity constitutes a very important diagnostic feature, totally unlike another ulcerative process with which syphilis is most likely to be confounded, namely carcinoma.

The deep ulcer of syphilis is the result of breaking down of the gummy tumor. We are concerned with the pathology of this process only so far as it enables us to have an intelligent understanding of the subsequent ulcer. We should know that the crowding together of a large number of infiltrated cells causes a choking of the circulation and consequent death and breaking down of the central portion of the gummy mass. The appearance of the deep syphilitic ulcer is in many ways characteristic. It is clear cut and deep, covered with thick yellowish pus and shreds of necrotic tissue. An areola surrounds the ulcer and its edges are indurated. The tendency of the ulceration is to involve only that portion which was the seat of the original gummy tumor. This frequently involves a large surface, *e. g.*, the entire posterior wall of the pharynx or the soft palate and the uvula. Bosworth insists upon this tendency and believes that ulceration never takes place outside of the limit of the previously infiltrated cells of the gummy tumor. The tendency of these ulcers to disfiguring cicatrization, and the presence of these cicatrices constitutes a material aid to diagnosis.

Perhaps in no disease is the destruction of tissue so rapid and the resulting cicatrice so disfiguring as in syphilis. In the pharynx these disfigurements may be annoying and sometimes interfere with the proper function of the part, but they are seldom inimical to life. Similar conditions, however, do not prevail in the laryngeal cavity; here the cicatrization and contraction may be so great as to encroach seriously upon its lumen, necessitating tracheotomy; or bands may form, stretching across the cavity and demanding division or tracheotomy.

The gummy tumor, as it occurs in the larynx, is a reddish mass, situated in any portion of the larynx—the posterior wall, the false or the true bands, or the arytenoids. Among the first symptoms are hoarseness and sometimes complete aphonia. Later there may be dyspnea, depending of course, upon the encroachment of the growth upon the lumen of the cavity; and cough of a peculiarly harsh and smothered character. Here, as in the pharynx, the gummatous growth is exceedingly likely to break down rapidly into the deep syphilitic ulcer, but in this locality a gummy tumor may persist for a long time as such, if uninterrupted in its course by treatment. We are thus perhaps more often called upon to make a diagnosis in the early or gummy tumor-stage in this locality than in the pharynx, though by no means frequently.

Let us pass now to the next most frequent cause of ulceration in the larynx and pharynx, namely, tuberculosis. In my experience tuberculosis of the pharynx is exceedingly rare and the few cases that have come to my notice have been complicated with other evidences of tuberculosis, usually pulmonary. The early symptoms of pharyngeal tuberculosis are very much the same as those of syphilitic or other ulcerative condition, *viz.*: soreness of throat and painful deglutition. In cases of syphilis and carcinoma, however, these symptoms occur in a previously healthy and often robust individual. Not so in tuberculosis. Here the patient has been previously weakened by the pulmonary or laryngeal complaint and is in consequence pale and anemic and has considerable elevation of temperature. These conditions may not obtain in cases of pure primary pharyngeal tuberculosis,—but such a condition is so rare, if it ever occurs, as hardly to be worth consideration.

The appearance that the pharynx presents when the seat of tuberculosis is about as follows: The mucous membrane is exceedingly pale and covered by thick, tenacious and ropy mucus. There may be several small spots of ulceration, the site of previous miliary tubercles, or two or more of these may have coalesced, forming one good-sized ulcer. The ulcer is on a level with the surrounding tissues and does not present a punched-out or

deep appearance. The edges are not clear cut, but seem to shade gradually into the surrounding tissues. There is no induration or areola. The surface of the ulcer and the pharyngeal wall is covered by thick, agglutinated mucus, efforts to dislodge which give rise to much pain and annoyance. There is very little discharge from the ulcer.

When the appearances of the ulcer are considered in conjunction with the marked constitutional disturbance—viz.: hectic, high fever, etc., it does not seem as though the condition should present any very great difficulty in diagnosis. Should, however, the rare condition, primary pharyngeal tuberculosis present itself, the difficulty may be greater, but even under such circumstances the appearance of the ulcer is characteristic, and the differential points are well marked, as I shall show later on.

In the larynx the case is somewhat different. In the first place, primary laryngeal tuberculosis, though rare, is much more common than the same disease in the pharynx.

Again, ulceration of any character in the larynx is likely to be accompanied by constitutional disturbance, so that we cannot rely too much on this feature, and while we may still regard constitutional symptoms such as hectic, night-sweats, etc., as favoring tuberculosis, they are not of such significance as in cases of pharyngeal tuberculosis.

Tuberculosis of the larynx, while not confined to any particular spot, is exceedingly prone to attack the interarytenoid space, and the base of the arytenoid cartilages, giving rise to that characteristic pear-shaped swelling which is due to edema of the arytenoid joints.

The ulceration, when seen, presents very much the same appearance as that already described as occurring in the pharynx.

The swelling of the arytenoids in many cases is so pronounced as to shield the interarytenoid ulcer from view.

As in the pharynx, there is the same accumulation of thick, agglutinated mucus the expulsion of which causes much difficulty and discomfort. One symptom not pathognomonic but very suggestive is severe pain in the ear and this is especially likely to be present should the

ulceration involve the base of the epiglottis. The voice is peculiar. It is hoarse, sometimes aphonic, and there is often considerable phonatory waste.

The next ulcerative condition in point of frequency is carcinoma. Carcinoma of the fauces is exceedingly infrequent. Gürlt reports but six cases of primary carcinoma of the tonsils in a total of 11,131 cases of carcinoma of all kinds. The first symptom of carcinoma is pain, which is of the same character as attends carcinoma in other portions of the body, viz.: lancinating, constant, often intolerable.

At first the pain is complained of during deglutition, but very soon it becomes constant and almost unendurable. Coincident with this symptom is stiffness at the angle of the jaw, rendering the opening of the mouth painful and causing difficulty in deglutition. Very early, often within a few weeks of the initial symptom, the cervical glands of the affected side become enlarged and painful.

The pain is referred to the spot affected and also, as in other ulcerative conditions of the upper respiratory tract, to the ear of the affected side. The intense boring, ever-present pain in the ear is often the chief complaint, appearing very early in the course of the disease, sometimes before the parts present any distinctive feature of the malady.

Indeed, instances are not wanting in which the ear has received treatment for a considerable time before the true nature of the affection was surmised. This, however, is a blunder impossible to any but a superficial or careless observer.

The presence of persistent sore throat, accompanied by difficulty in deglutition and severe pain in the ear, in a person past middle life should put us on our guard, and we should at least suspect the presence of malignant disease.

All the symptoms enumerated increase rapidly in severity, and in the later stages deglutition becomes almost impossible from the pain excited by the act. The patient is loth to take food and confines his diet to liquids or semi-solid food. In consequence there is failure of nutrition—to which is added septic infection from absorption of decomposing detritus and we have the condition that gives to us the designation carcinomatous cachexia.

The progress of carcinoma of the pharynx is often exceedingly rapid—the growth may begin to ulcerate within three months from the first symptom. The entire course of the disease from the inception to death is covered by a period of from six to eighteen months.

Inspection of the fauces when carcinoma is present reveals a condition totally unlike that seen in any other disease that attacks this locality. Tonsil, soft palate and pharynx are involved with a frequency in about the order enumerated.

The course is so rapid, however, that unless a case is seen early all of these structures may be involved and serious difficulty arise in determining the original site.

The tonsil is the most frequent starting-point. I recently had the privilege of observing a case from the very incipency. The symptoms detailed, and the appearances presented are drawn largely from a study of this case. The tonsil at first presents a dark-red appearance, with a grayish-white spot in the center. It seems as though the mucous membrane was pushed outward by some body imbedded in the tissue of the tonsil. The velum, the posterior wall of the pharynx, and all of the surrounding tissues on the affected side are hyperemic. The growth of this projecting mass is exceedingly rapid. Within a month it exceeds the confines of the tonsil and spreads over the surrounding tissues in a cauliflower-like manner. At this period there is no ulceration, though there is excessive vascularity. How unlike this to that disease with which it is most likely to be confounded, viz.: syphilis.

Within three months ulceration of the surface of the mass takes place. This ulcerative process is peculiar and characteristic. The ulcer is not a deep one, giving a gouged-out appearance to the mucous membrane such as is seen in other ulcerative diseases. It seems rather to be a destruction first of the most prominent portion of the growth, and breaking down of the tissues adjoining the growth. As fast as the tissues at the margin of the growth melt away, the growth itself spreads over the part. While there is undoubtedly a loss of normal tissue the actual appearance presented is a substitution of an ab-

normal tissue in excessive quantity for the normal.

The growth spreads rapidly to the surrounding tissues, ignoring anatomic boundaries and attacking everything in its way. It very early involves the velum and the posterior wall of pharynx, extending upwards into the naso-pharynx and downwards, involving the sides of the tongue and the inner surface of the jaw. The destruction and the discharge of dead tissue are accompanied by more or less free secretion and a very disgusting and penetrating odor.

Carcinoma of the larynx is somewhat more frequent than carcinoma of the pharynx, Gürlt's tables showing 63 cases in a total of 11,131 cases.

The location within a concealed cavity and in the early stages the similarity of symptoms to those of other forms of ulcerative disease render an accurate diagnosis extremely difficult. When, however, the symptoms are grouped together and all phases of the case, intra-laryngeal and extra-laryngeal, are considered, no insuperable difficulty will be encountered in the majority of instances.

Let us briefly consider the development of this form of carcinoma. The first symptoms are pain and impairment of voice. The former is of the same sharp, persistent and lancinating character that has already been adverted to—and here also the site of pain is frequently referred to one or the other ear.

The progress of the disease is rapid, but not nearly so as is carcinoma of the pharynx. Indeed there are some instances upon record in which the progress of the disease has been exceedingly slow, and it is under such conditions that the greatest difficulty in differential diagnosis is experienced. In the main, however, the progress of laryngeal carcinoma is rapid.

Very early, in consequence of encroachment of the growth, dyspnea occurs—also ulceration, with hemorrhage, occurs at an early period.

Dysphagia constitutes a distressing though by no means constant symptom. The odor attending a case of malignant disease of the larynx is peculiarly horrible and disgusting and when once recognized it is not soon forgotten. Some authors regard this odor as pathognomonic and

claim to be able to diagnosticate a case from its presence.

I am quite sure, however, that cases of syphilitic disease of the larynx have come under my notice with an odor so penetrating and disgusting as to exceed the odor from any other disease, and I must confess that my olfactory bulbs have not been trained to so high and sensitive a degree as to enable me to distinguish between these two very disgusting and intense odors.

Laryngoscopic examination early in the disease reveals the larynx the site of a growth, which may occupy any position in its cavity; the true or false bands, the arytenoids, or the posterior wall. Later the growth breaks down and we have an ulcer filled with necrotic tissue and giving forth an horribly offensive odor. Here, however, as in the pharynx, the ulcer is characteristic. It does not appear as a loss of tissue alone, but rather as a substitution of abnormal for the normal and ulceration of the former. In other words, it is growth accompanied by ulceration. This condition is very different from that presented by all other forms of ulceration—in which after the first stage has passed and the infiltrated tissues have broken down we have as the predominant, characteristic feature destruction and loss of normal tissue. There may be edema of the surrounding tissues but there is always a clear-cut, distinct and characteristic ulcer.

The least common ulcerative condition to be considered is that attending lupus. Lupus is an exceedingly rare form of disease in the larynx and pharynx. It is usually associated with a similar condition of the cutaneous surfaces and this constitutes an important feature in its diagnosis.

Lupus is very insidious in its approach and of an exceedingly chronic nature.

It consists principally in an infiltration of cells and thickening of the tissues, with later a slow breaking down or rather absorption. The ulcerative process is so slow that one can seldom distinguish a true, clearly defined ulcer. We know by the results, namely, absorption and destruction of tissue, that some such a process has taken place. At the same time that this process of ulceration is in progress there seems to be an effort of nature to heal over the parts affected; in conse-

quence there are numbers of unsightly and distorted cicatrices. The result is that the part appears lumpy and distorted.

The palate and the uvula are the most frequent sites.

The uvula presents an irregular and distorted appearance and there is much loss of tissue, so that the uvula appears as a mere knob.

Rarely can well-marked ulceration be detected. In consequence of this peculiarity of the ulcerative process there is no discharge of pus or detritus. The subjective symptoms are those of discomfort rather than pain. Deglutition and phonation are in a measure interfered with, in proportion to the amount of tissue involved, and in accordance with the localization of the morbid process.

In the larynx lupus presents symptoms only of interference with the proper function of this organ. The voice is altered in character or is entirely lost. Dyspnea sometimes occurs, though this is rare, for the reason that the disease consists essentially in a destruction of tissues, with no tendency to the production of new abnormal tissue.

Laryngoscopically there is first an infiltration of the tissues and later a gradual absorption; almost never does one observe well-marked ulceration.

We have here passed over hastily the chief causes of ulceration of the pharynx and larynx. In the main the symptoms of each condition are so distinctive as to make the diagnosis comparatively easy. Cases occur, however, in which it is necessary to group the symptoms, and others in which a conclusion as to the nature of the disease is arrived at only by means of application of the therapeutic or the microscopic test.

Perhaps the two diseases most frequently confused are syphilis and tuberculosis. Carcinoma in its early stages offers many difficulties in diagnosis. But a very short time, however, is required to clear up the matter. As to lupus, the history, course and appearance are so essentially different from those of the other forms of ulceration as to almost eliminate this condition from the group.

In order to more clearly recognize the dissimilarity of these four ulcerative conditions, individual and characteristic symptoms have in the accompanying tab-



ulation been placed side by side. This mode of procedure will clear up the larger number of cases, but even this analytic method will leave a few cases doubtful. Fortunately we are dealing with an accessible locality and we can readily remove a portion from the surface or cut out a generous piece from the growth, bringing

to our aid the microscope. Again, as between syphilis and carcinoma and tuberculosis the therapeutic test may be employed. While I never neglect to employ full doses of anti-syphilitic remedies in doubtful cases I have no great reliance on this method.

## ULCERATION OF THE PHARYNX.

### SYPHILIS:

Pain usually slight.

Ulcer clear cut. Destruction of tissue great. Appears very early in the course of the disease—within 2 or 3 weeks.

Profuse purulent discharge and necrotic tissue cover surface of ulcer.

Borders of ulcer indurated and hyperemic.

Ulcer rapidly destructive and extends deeply.

Ulcer confines itself to pharynx, rarely extends to naso-pharynx—never to larynx.

Cicatrices often present.

General condition unimpaired.

Often evidences of specific disease in other organs.

No fever. Rapidly improves under iodids.

Sputum contains no distinctive morbid product.

Microscopic examination of excised tissue reveals large number of small round cells.

### CARCINOMA:

Pain, lancinating, severe, constant, often excruciating. In many cases referred to ear.

No clear-cut ulcer. Normal tissue replaced by morbid growth. Ulceration does not occur for 2 or 3 months after the appearance of growth.

Very little discharge covers the growth. When ulceration occurs the surface is covered by a thin sanious discharge.

The growth is of stony hardness. An areola surrounds the growth, but no induration occurs until the parts are encroached upon by the growth itself.

Quite rapid in its course; extends in all directions.

No anatomic boundary confines the growth; extends in all directions and attacks all tissues.

No cicatrices.

Early in the course of the disease the general condition is good; later, however, the health fails rapidly.

No manifestations of previous disease.

No fever. The disease is uninfluenced by iodids.

Examination of sputum negative.

Microscopic examination of growth shows characteristic cells of the various forms of carcinoma.

### TUBERCULOSIS:

Pain severe; not constant; aggravated by efforts at deglutition or clearing the throat of inspissated mucus; sometimes referred to ear.

Ulcer shallow and not clear cut, shading imperceptibly into the normal tissue; ulceration occurs very early.

The surface of the ulcer is covered by mucopurulent secretion and agglutinated mucus.

No areola or induration.

Erodes slowly and laterally, not deeply.

Confines itself to mucous membrane of pharynx; extends laterally.

No cicatrices.

General condition poor from the outset, indicating some grave constitutional disease.

Pulmonary and laryngeal manifestations.

High fever. Is not influenced by iodids.

Tubercle-bacilli found in sputum.

Microscopic examination shows giant-cell tubercle-bacilli and other evidences of tuberculosis.

### LUPUS:

Pain slight, if any.

Ulceration rarely seen, the process being rather marked by the absorption of tissue.

Little or no secretion.

Disease consists of a series of indurated nodules.

Exceedingly slow in course.

May extend to larynx.

Cicatrices numerous.

General condition very slowly impaired.

Cutaneous manifestations previous to and coincident with the pharyngeal.

No fever. Not influenced by iodids.

Examination of sputum negative.

Microscopic examination very similar to that of tuberculosis.

## ULCERATION OF THE LARYNX.

**SYPHILIS:**

Pain usually slight.

Attacks any portion of larynx and ulcerates rapidly.

Is rarely seen in the stage of induration—the first evidence being a clear-cut, deep ulcer.

Some induration around the ulcer, but usually very little edema.

Ulcer extends deeply, often involving cartilage.

Surface of ulcer covered by muco-purulent secretion and necrotic tissue.

Mucous membrane hyperemic and injected.

Laryngeal stenosis not common until cicatrization occurs.

General health unimpaired.

Frequent evidences of syphilitic disease in other tissues.

Rapidly improves under the iodids.

Sputum contains no distinctive morbid product.

Microscopic examination of excised tissue reveals large number of small round cells.

**CARCINOMA:**

Pain constant, lancinating.

Attacks any portion of larynx and ulcerates more slowly than syphilis.

The first appearance is that of a new-growth occupying the laryngeal cavity—no clear-cut ulcer.

The growth fills or encroaches on the laryngeal cavity.

Growth extends in all directions, involving all tissues in its course.

Surface of growth covered by discharge.

Mucous membrane hyperemic.

Laryngeal stenosis quite common.

Early in the disease no impairment of general health; later marked cachexia.

In primary laryngeal carcinoma no other involvement until later in the disease.

Iodids have no influence on the course of the disease.

Examination of sputum negative.

Microscopic examination of tissue shows characteristic cells of various forms of carcinoma.

**TUBERCULOSIS:**

Pain in deglutition severe.

The favorite site is in the inter-arytenoid space or the base of arytenoid cartilages; ulcerates slowly.

Usually the first appearances are small spots of induration, rapidly followed by great edema.

Great edema of arytenoids.

Ulceration extends laterally but not deeply.

Surface of ulcer covered by thick, muco-purulent secretion and agglutinated mucus.

Mucous membrane pale.

Laryngeal stenosis rarely occurs.

Health impaired previous to laryngeal involvement.

Previous and coincident pulmonary trouble.

Iodids have no influence.

Tubercle-bacilli found in sputum.

Microscopic examination of tissue shows giant-cell tubercle-bacilli and other evidences of tuberculosis.

**LUPUS:**

No pain.

Attacks any portion; ulcerates very slowly.

Nodular masses.

Little or no edema.

Very slow in progress; ulcer rarely observed.

Little or no discharge.

Mucous membrane injected.

Slight stenosis.

Very slight impairment of general health.

Frequently cutaneous manifestations.

Iodids have no influence.

Examination of sputum negative.

Microscopic examination very similar to that of tuberculosis.

## DISCUSSION.

DR. C. A. VEASEY asked if Dr. Gibb had ever met with patients showing ulcerations of the pharynx or the larynx produced by inhalation of the dust of certain chemicals. It is a well-established fact that workers in potassium bichromate for example, are prone to ulceration of the mucous surfaces of the nose and mouth, but the question arises whether the drug produces the same results in the pharynx and the larynx. Dr. Veasey referred to a patient presenting marked reduction of central vision, accompanied by a large central scotoma in each eye, who has had severe ulceration of his nasal septum, which finally perforated, as well as a number of smaller ulcerations in his mouth. The whole trouble is believed to be due to inhalations of dust of potass-

ium bichromate, and the anilines. The man is employed as a "weigher" in a dye-works, and it is his duty to weigh the different ingredients from which the dyes are mixed. For seven or eight years he has remained from a half hour to an hour and a half daily in a very close room, weighing these chemicals, and, according to his statement, the room is always filled with exceedingly fine particles of dust that he has been obliged to inhale. The chemicals chiefly used are potassium bichromate and anilines, and the latter do not produce ulceration. A respirator was recommended for use while closeted in the weighing-room and not only his eye-trouble but his nasal and buccal trouble began to improve at once. Whether it was the potassium bi-

chromate or the anilines that gave rise to the retro-bulbar neuritis it is not possible to state positively.

DR. L. JURIST said that the key-note of therapeutics was struck in the statement that carcinoma of the larynx can at a certain stage be readily recognized; that at a very early stage the diagnosis is sometimes impossible is also true. As between tuberculosis and syphilis a great deal has been said and a good deal of doubt still exists. If a gumma be present—a tumor-like mass—which promptly yields to potassium iodid, the diagnosis is tertiary syphilis. If it does not yield the mass is removed and microscopically it may be tuberculous or carcinomatous. Dr. Jurist referred to a case in which upon microscopic examination of a mass removed from the larynx supposed to be a fibroma, the histologic structure of tuberculosis was found. Lupus of the larynx and pharynx is so rare that a twelve or fourteen years' experience in a pretty large clinic never demonstrated a case to him.

Perforations of the nasal septum and irritation of the nose and throat are very common among workers of all sorts and the physician should not be in a hurry to accuse his patients of syphilis because of a perforation of the septum which may have been caused by an irritant, and the hole made by the patient in endeavoring to remove the irritant.

In the diagnosis of ulceration or growth in the upper air-passages, a valuable adjunct is the use of the finger. A new-growth may present the peculiar hardness of malignancy, or it may be soft. In this way the key-note to treatment will often be gained. When a finger introduced into the patient's mouth encounters a curious resistance not much need be expected of the iodids, though they should be given until any doubt is removed. When the mass is soft and shows signs of breaking down in the interior without any superficial destruction, then the more quickly from 60 to 240 grains of potassium iodid per day are administered the safer is the patient.

DR. A. W. WATSON said that Dr. J. Solis-Cohen pointed out the fact many years ago,

that those employed in dye-works frequently had perforation of septum due to the chromic dyes employed. Dr. Watson has seen this many times himself, and he has been told by the workers themselves that perforation of the septum is considered an unavoidable result of the occupation. Chromic acid is a solvent of cartilage. From picking with the finger the mucous membrane becomes abraded and the chromic acid is thus permitted to come in contact with the cartilage.

Speaking of syphilitic ulcers in the pharynx, Dr. Watson said that he had seen a good many cases not presenting rapidly sloughing ulcers but the appearance of epithelioma.

DR. JOSEPH S. GIBB said that it has long been known that workers in chromic acid are liable to perforations of the septum and while this drug is used quite largely in the nasal chambers, in consequence of its proneness to attack the cartilage care must be exercised in its use on the septum.

Dr. Gibb expressed his belief in the use of the iodids as a means of differential diagnosis, although reliance cannot always be placed upon them. In a case in which syphilis of the larynx was suspected, large doses of iodids were given to clear up the diagnosis. The symptoms were markedly though not entirely relieved. Later investigation points rather to a malignant than a syphilitic character. The iodids in this case reduced the edematous thickening and relieved the symptoms of stenosis, but the growth was uninfluenced.

It is true that syphilitic throat does not always give rise to unmistakable symptoms, but the exception proves the rule. There are cases in which the syphilitic process is exceedingly slow, but even here there is something in the case characteristic of syphilis. Though the ulceration progressed slowly, the tendency was toward deep rather than lateral extension. It has been admitted, however, that cases do occur in which the difficulties are so great that it becomes necessary to excise a piece of the diseased structure to thoroughly clear up the diagnosis.

## THE RADICAL CURE OF MALIGNANT DISEASE BY THE CATAPHORIC DISSEMINATION OF MERCURIC SALTS; A FURTHER CONTRIBUTION.

G. BETTON MASSEY, M.D.

[Read November 10, 1897.]

This paper is a further contribution to the subject of a radical cure of malignant disease as published in a paper read before the American Medical Association at its recent meeting in Philadelphia, and in certain previous publications during the past four years. The substance of it is corroborative of the announcement more particularly made in the last paper that mercury may be disseminated throughout a malignant new-growth from the positive pole of a galvanic current, provided the electrode consists of one or other of certain metals, the mercury penetrating the flesh in the immediate neighborhood of the electrode as a nascent oxychlorid. It will also relate an additional discovery to the effect that I have determined the superior qualities of gold as the substance of the electrode from which the mercury is disseminated.

The method by which mercury is disseminated throughout a morbid mass is dependent upon the electro-physical fact that any positive electrode of base metal will be eroded when it is used to transmit a current through an electrolyzable material such as flesh or tumor-substance, the oxygen and chlorine produced at this pole by electrolysis uniting with the metal to form oxychlorids. Simultaneously with their production these oxychlorids are repelled from the positive pole through the electrolyte towards the negative pole. An oxychlorid of a base metal thus produced at the positive pole of a galvanic current is made to pervade the immediate neighborhood of that pole to a distance proportional to the volts and time of application, and to a density and amount proportional to the millicoulombs of current. These facts have all been known for a long time, though much neglected in their possible therapeutic application, particularly when it is recalled that the salts thus capable of being injected into the exact spot we

wish them, and in any dose to suit us, without affecting the rest of the body, are in their nascent and hence most active condition. My personal contributions to the subject are included in the statement that I was the first to employ mercury in this way, and that I have obtained clinical proof that carcinomatous structure loses its malignant character when fully impregnated by mercuric salts in this manner.

My first observations were made on mercury as a coating of zinc electrodes, the latter being amalgamated, as it is called, with mercury. This was an effective method, but has the disadvantage of a simultaneous dissemination of zinc oxychlorid along with the mercury. The result is a distinctly cauterant effect, which, though of value at times, is by no means necessary in the application of the method. The use of a base metal from which to disseminate the mercury has also the disadvantage of lessening the amount of mercury that is disseminated, as much of the electrolytic and cataphoric action is consumed upon the zinc. Notwithstanding what I now know to be the disadvantages of this method with zinc, the principal drawback being the production of sloughs, all the cases reported in previous papers were treated in this way, with a success that has been most encouraging.

About two months ago I determined to ascertain whether amalgamated gold electrodes would be better; or, in other words, whether the mercury that readily clings to gold could be as easily sent into tumors from its surface as from zinc. The result of the first experiment was conclusive, as a well-coated surface was denuded in a few minutes, the darkened alloy alone remaining as a coating. The theoretic conclusion that all the energy would be expended on the baser metal was thus

proved to be a fact. The mercury disappeared so quickly from the gold electrode, indeed, that it was impossible to employ the same currents as formerly without turning the application into a mere cauterization with the freed oxygen and chlorine. I therefore devised instruments by which a continuous supply of mercury could be secured about the active pole, and find that there is little or no cauterization produced so long as this supply is kept up.

I herewith submit these instruments, and will demonstrate their action on a piece of meat. I will also prove that the mercuric salts penetrate the meat to a considerable distance, not only by the ocular evidence of its disappearance from the electrode surface and the darkening of the meat near the electrode, but by picking it up again at a considerable distance from the electrode on the negative pole of another current, which reduces the salts again to a metallic state.

In the employment of the method the electrode is inserted by puncture into the middle of the tumor and mercury is freely injected through the former in such quantity as to surround the instrument with a cushion of this metal. With large pads connected with the negative pole placed on a distant and properly selected portion of the skin (so arranged as to produce the least effect on the heart and the respiration) a current varying from 300 to 1000 milliamperes is slowly turned on, under general anesthesia, and kept steadily flowing from fifteen minutes to half an hour.

In some cases the sarcoma or carcinoma shrinks at once, and is decidedly smaller and softer the next day. The procedure is repeated a week or more subsequently if it appears that all of the malignant cells have not been killed.

In the cases in which zinc instruments were used with strong currents the sloughs produced were unpleasant to a moderate extent, but since the gold instruments have been used no sloughs have appeared, the openings made by the electrodes being merely seared enough to remain patent. A dark, watery liquid drains from these openings that is absolutely free from odor, the wounds remaining aseptic under simple dressings, probably because of the immense quantity of mercuric salts disseminated through the tumor. There has been no evidence of a constitutional absorption of the mercury save that one patient noticed a tenderness in her teeth for a short time.

I exhibit to-night a patient who has had four applications for sarcoma of the superior maxilla, all within two weeks. The tumor presented a surface-extent of about two inches by one inch, had destroyed the cancellous structure of the bone and extended deeply upwards into the upper jaw. There is now scarcely any of it left. I have also under treatment a case of carcinoma of the lip, one of the rectum, another of the breast, and two of the uterus; also sarcoma of the tongue and another of the thigh; but while the progress of some of these cases is most remarkable, it is yet too soon to report them for publication.

## A CASE OF SYMPATHETIC OPHTHALMIA TERMINATING IN RECOVERY.

T. B. SCHNEIDEMAN, M.D.

[Read November 24, 1897.]

A man, 37 years old, and a hard drinker, received on March 11, 1897, a destructive injury of the right eye from the accidental explosion of a cartridge, the wheels of a cart passing over the latter near him upon the street. He was at once taken to the Polyclinic Hospital, where I saw him.

The ball, or perhaps a piece of the cartridge, penetrated the sclero-corneal junction and adjacent sclera upon the temporal side and also inflicted a ragged perforating wound in the upper lid. This was suggested to be the place of exit of the foreign body by Dr. Jackson, who saw the

patient a few days later. The anterior portion of the globe contained blood, which obstructed all inspection of the deeper portions of the eye. The iris had prolapsed into the wound and the lens appeared to have been injured. The man was treated conservatively, partly for the purpose of ascertaining more clearly the exact condition of the eye after absorption of the hemorrhage, especially as to the presence of a foreign body, and partly to permit an extremely nervous condition bordering upon delirium tremens to subside. After a few days the blood in the anterior chamber was absorbed and the lens was now seen to be opaque. Light-perception and projection were perfect. It was decided therefore not to enucleate at present, particularly as the skiagraph, kindly made by Dr. Max J. Stern, failed to show the presence of a foreign body.

On March 17, six days after the accident, the lens was removed and iridectomy performed at the site of the original wound, where the iris was prolapsed and incarcerated. Healing progressed satisfactorily and the patient was discharged from the hospital, at his own request, with instructions to report regularly. A slight amount of vision was preserved and improvement was looked for after the blood, which could be seen in the vitreous, had undergone more complete absorption.

The patient neglected to return to the hospital, but immediately resumed his former habit of excessive drinking. On April 30 he presented himself at the clinic and was re-admitted to the hospital, with well-marked sympathetic ophthalmia of the left eye, as manifested by irido-cyclitis, with deposits upon the capsule of the lens and Descemet's membrane, and fine opacities in the vitreous. The disc was red and hazy and the retinal veins were decidedly tortuous. The tension was —1 and vision was reduced to 4-60. The man stated that sight had begun to fail without pain about a week previous to his return. The right eye had become somewhat painful, and what little sight had remained was entirely gone. Upon the following day the patient was also seen by Drs. Jackson and de Schweinitz, who concurred in advising immediate enucleation of the right eye, and this was accordingly done. The man was again on the verge of delirium tremens. Under the

hospital régime, his general condition at once began to improve.

By May 18 the stump of the right eye had healed entirely. The inflammation in the left eye continued for many weeks and much apprehension was felt as to the outcome. Improvement finally set in slowly, interrupted by several exacerbations.

By the middle of July the eye was almost entirely free from redness, though still irritable. There were numerous deposits upon the capsule of the lens and the vitreous was still somewhat hazy. Vision equalled 4-100. One month later the only remains of the severe process through which the eye had passed was the presence of some spots of opacity upon the anterior capsule. With a correcting lens vision was just short of normal; the accommodation was somewhat below the standard usual at the patient's age.

The treatment after admission consisted in regular and persistent inunctions with mercury; atropin was instilled throughout the whole period of his stay in the hospital (three months), with an occasional abstraction of blood from the temple when the inflammatory symptoms became more intense.

This case presents several points of unusual interest; primarily, of course, the gratifying termination. It is, perhaps, too early to be certain that a definite and final cure has been obtained—at least two years should elapse before certainty of further immunity is established; but so far as the case goes, we are justified in entertaining a feeling of satisfaction. The habits of the man are, of course, an untoward feature. The cachexia that chronic alcoholism induces was probably an important factor in the etiology of the case. Infection of various kinds is now regarded in many quarters as a powerful predisposing cause in furthering the development of disease in the sound eye after injury of its fellow.

This case enforces the lesson, if this were needed, that conservative treatment looking to the saving of an eye that has been severely injured and which is a menace to the other should only be undertaken when the patient can be kept under constant observation. This was the intention in the case reported, and the man was duly charged to return regularly to

the clinic. His failure to do so was his own fault, begotten of his vicious habits.

In conclusion I desire to express my thanks to Dr. F. T. Stewart, at the time interne in the Polyclinic Hospital, for his careful attention to the case, as well as for the notes of its daily progress, which he placed at my disposal.

### DISCUSSION.

DR. EDWARD JACKSON said that sympathetic ophthalmia is a disorder of such grave importance that every case should be placed on record. The disease is a rare one. He had seen but three cases, one of which he reported to this Society in 1887. Although the affection is often extremely painful after plastic exudation has taken place, and may continue so after vision has become almost totally lost, its invasion is liable to be insidious and unattended with pain, and may be neglected by the patient. A few years ago importance was attached to the recommendation not to enucleate the exciting eye in the early stage of active inflammation, because this was followed sometimes by aggravation of the symptoms in the sympathizing eye. This recommendation was never universally accepted; and, during the past ten years a number of cases have been reported in which prompt operation has been followed by recovery. This is now regarded as the established proper course; and it is well to follow enucleation with the free use of mercury.

There are some reported cases in which there is a good deal of question about the diagnosis of sympathetic ophthalmia, but in the present case there are the three elements of the injury to the exciting eye, the interval of time, and finally the characteristic inflammation, as far as the local conditions are characteristic of sympathetic ophthalmia in the sympathizing eye. The case was seen by several who are familiar with the disease, and there was no question in the minds of any but that the case was one of sympathetic ophthalmia. The results are exceedingly gratifying and in all probability the cure is complete.

Cure cannot be regarded as complete until two years have elapsed, and in cases of sympathetic ophthalmia relapses continue to occur through long periods of years and sometimes after months of comparative immunity. It is doubtful if in any case in which such complete restoration has occurred and for the length of time reported in the present case, the disease recurred.

### AN EXPEDIENT TO DETERMINE POSITIVELY WHETHER A COMMUNICATION EXISTS BETWEEN URINARY FISTULÆ IN THE LUMBAR OR HYPOGASTRIC REGION AND THE BLADDER OR KIDNEY.

ORVILLE HORWITZ, B.S., M.D.

[Read November 24, 1897.]

The surgeon, when called upon to treat a fistulous opening presenting itself near the location of the kidney or bladder, is often in doubt whether or not it be connected with either of these organs; though in many cases the urinous odor accompanying the discharge from the sinus assists in forming a diagnosis.

Frequently, when the kidney is implicated, the fistulous tract is narrow, and only a small quantity of urine escapes, while at the same time a large amount of pus is discharged, so that it is often difficult to determine whether urine be pres-

ent or not. Then, again, a small sinus from the kidney, or an opening leading to the bladder, may be temporarily blocked by a plug of excrementitious matter, so that it is impossible for the urine to secure an exit, and the diagnosis becomes proportionately obscure.

Recently, whilst making investigations with methylene-blue in the treatment of a number of cases of urethritis, I administered the drug in small doses, with the result of tinging the urine a deep-blue color. It occurred to me that when a fistula exists and it is doubtful whether or

not it communicates with the kidney, the administration of methylene-blue at bed-time might impart a blue stain to the dressing on the following morning if the communication were complete.

I selected two patients from whose kidneys calculi had been removed some months prior to consulting me, the result of the operations being fistulous tracts in the lumbar regions of each, from which pus was being discharged in small quantities, although it was uncertain whether the discharge was mixed with urine or not.

One grain of methylene-blue in capsule was administered to each patient. In the morning the urine passed *per urethram* was found in both cases to be of a dark-blue color. The dressings covering the fistulous opening in one of the patients was stained a distinctly blue tinge, so that it was certain that the fistula communicated directly with the kidney. In

the second case there was no trace of discoloration of the dressing, so that it could be inferred that the fistulous tract did not communicate with the kidney.

I likewise administered the drug in a case of fistulous opening following an operation for suprapubic cystotomy, which had been performed a year before the patient came under my observation. The tract was exceedingly narrow, scarcely permitting the passage of a fine probe; there was but a slight discharge. The day following the administration of the methylene-blue the dressings covering the opening were stained blue.

The simple expedient here suggested would seem to render the diagnosis of communication between fistulæ of the bladder or kidney well-nigh certain. It is submitted to the profession with the belief that it may prove a reliable method of arriving at a definite conclusion when doubt exists.

## DISCUSSION.

DR. HORWITZ said that in some one hundred cases of acute urethritis in which he had been using methylene-blue to see what effect it would have on the gonococcus, careful examination failed to disclose the presence of albumin in the urine. In some of the cases the arsenic said to be present in the methylene-blue gave rise to acute diarrhea and the dose of the drug had to be reduced or the treatment entirely discontinued. In other cases two-grain doses produced strangury. In four cases in which decided strangury occurred there was acute albuminuria, such as is encountered in cases of acute posterior urethritis, but as soon as the drug was discontinued the albumin disappeared completely. The presence of

albumin under this condition was probably due to muscular contraction of the neck of the bladder and damming up of urine in the ureter.

DR. A. A. ESHNER said with reference to strangury following the use of methylene-blue that this could be prevented by the simultaneous administration of powdered nutmeg. In the treatment of malarial fever methylene-blue has been given in capsule in doses of a grain from three to five times daily in conjunction with powdered nutmeg, and this combination seems to have been successful in preventing the vesical tenesmus and disturbance in micturition that occurred when methylene-blue was administered alone.

## OBSERVATIONS TENDING TO SHOW THAT TINCTURE OF DIGITALIS IS INERT IN TABLET-FORM.

JUDSON DALAND, M.D. (UNIV. OF PENNA.)

[Read November 24, 1897.]

The enormous number of compressed tablets of digitalis that are employed instead of the tincture or the fluid extract suggested the following experiments:

An adult male, suffering from a chronic

disease unassociated with any affection of the heart or the circulation, was given five tablets, or the equivalent of ten minims of tincture of digitalis, every four hours for four doses on September 14, at



which time his pulse was 100, the temperature 99.2°F., the respiration 28. This medication was continued for three days, when the tablets were increased in number to eight every four hours for four doses, or the equivalent of 64 minims, this dosage being continued for eight days. In the eleven days that the man was under the influence of digitalis he received in all 271 tablets, or the equivalent of 542 minims, or about 1,084 drops. The tablets employed were made by a well-trained pharmacist.

The following is a record of the results obtained:

	Pulse.	Pulse.
September 14,	4 A. M., 98	8 P. M., 94
" 15,	8 " 100	12 M., 88
" 15,	.....	6 P. M., 96
" 16,	8 A. M., 92	4 " 92
" 17,	4 P. M., 96	6 " 76
" 18,	8 " 87	
" 20,	8 A. M., 104	
" 26,	3.23 P. M., 96	

On September 28, after the drug had been suspended for two days, the pulse was beating regularly at the rate of 96 per minute and was normal in force. The intravascular pressure was moderate; and the radial wall was a trifle thicker than normal. The heart-sounds were normal; the temperature varied between 97° and 99° F. and the respirations between 20 and 28 per minute.

The results of this careful examination showed that there was no perceptible effect upon the cardio-vascular system from the taking of digitalis in tablet-form. This result was corroborated independently by another physician.

Simultaneously, and under similar conditions, another patient was given tincture of digitalis for ten days in ten-minim doses every four hours for four doses. The preparation was made in the pharmacy of the Philadelphia Hospital, and the well-

known effect of digitalis was secured. The pulse, which normally varied between 76 and 80, descended under the influence of the drug, as will be seen by the following table:

	Pulse.	Pulse.
September 15,	8 A. M., 76	8 P. M., 80
" 16,	8 " 84	8 " 79
" 17,	8 " 80	8 " 72
" 18,	8 " 60	8 " 52
" 19,	8 " 60	8 " 50
" 20,	8 " 50	8 " 90
" 21,	8 " 80	8 " 90
" 22,	8 " 60	4 " 50
" 23,	8 " 72	4 " 56
" 24,	8 " 50	12 noon 68
" 24,	.....	4 P. M., 68

On three occasions the evening record showed a pulse of 90 and the morning record one between 50 and 60. This was due to exertion and nervous excitement.

On the tenth and last day of the administration of the drug, the pulse was regular in force and rhythm, the tension was increased and the walls of the artery seemed slightly thickened. The heart was acting energetically, the apex-beat was more forcible than normal and the muscular element of the first sound of the heart showed increased strength two days after the tincture of digitalis had been withheld.

Although positive deductions are unwarrantable from the small number of observations recorded, still one may infer that the tablets employed in the first case do not represent the active ingredients of digitalis. It is to be remembered that these tablets were made by a skilled pharmacist and that the tincture was prepared by Mr. Joseph W. England, Chief Drug-gist to the Philadelphia Hospital.

If these few remarks excite a full discussion and thereby crystallize the opinions of the members of this society upon this important subject, the outcome of this communication will be of great value to the medical profession.

## DISCUSSION.

DR. H. A. HARE pointed out two radical errors that Dr. Daland had made in his experiments. In the first place he gave the tincture of digitalis to one patient and tablets of digitalis to another. In the second place, it would have been better to have taken some tincture of digitalis, had tablets made, given them to the man, then allowed a sufficient period of time to elapse during

which the effect of these administrations might pass away and then give that man some of the tincture from which tablets had been made.

There is another possible fallacy in the experiment, as digitalis is an exceedingly variable drug, inasmuch as its active principle cannot be isolated in the sense that a quantitative analysis can be made; dif-

ferent samples yield different quantities of so-called active principles, even if they could be isolated satisfactorily. Finally, these different active principles vary, and different samples of digitalis have very different physiologic action. Then, too, one or two active principles of digitalis are substances very easily affected by heat. One of the advantages in the employment of triturations and of tablets is supposed to depend upon the fact that the drug becomes minutely subdivided and therefore is more easily absorbed. In rubbing up with sugar of milk a certain amount of heat is generated and it may be that the digitalis thus undergoes some alteration. It is possible further that in compressing the tablets they are exposed to the heat of the compressing machine and for the purpose of increasing their cohesion.

DR. HENRY BEATES said that it has been clearly demonstrated that the tincture of digitalis is so variable in physiologic activity, that whether it be administered in the form of tablet or tincture, its results cannot be relied upon, nor definitely determined. If a tincture is inert and it is made into a tablet, this latter is necessarily inert. On the other hand, a tincture representing a certain percentage of the various active ingredients of any drug, must in the form of a tablet constitute a medicament of similar complexity. A drug if assayed physiologically represents a definite factor in the treatment of disturbed function, and tablets prepared therefrom would necessarily be the equivalent of a uniform preparation, and supply a sure basis upon which to formulate accurate therapeutics. The great defect of the tincture of digitalis belongs also to other tinctures, because crude drugs of vegetable origin contain several active principles in various percentages, and some of these are strangely antagonistic one to the other. In digitalis the active principles digitalin, digitalin and digitin are vaso-motor stimulants, while digitonin is a vaso-dilator, and if the leaves from which a given tincture is prepared should happen

to possess a certain percentage of the latter, it is entirely possible for the vaso-dilator action to neutralize the vaso-constrictor effect. These facts have much to do with the contradictory statements concerning the value of digitalis. The active principles of this drug also vary in their solubility in various menstrua, and thus the tincture and the infusion represent totally different percentages of active ingredients, as some are more soluble in water and some in alcohol. The great lesson to be learned is that all tinctures are, by reason of the natural conditions obtaining, thoroughly unreliable as pharmacology supplies them, and unless they are assayed, and their true physiologic value determined, they should be eliminated entirely from the materia medica. After all, the only proper remedies are carefully isolated active principles, and these alone should have their value determined and be employed.

DR. HARE said that some years ago he had made certain analyses of various tinctures of *nux vomica* prepared according to the United States Pharmacopeia by a number of well-known druggists. It was found that not a single one of these tinctures, all made by reputable druggists, contained anything like the active principles, strychnin and brucin, expected of them. If variations of this kind can take place when reputable pharmacists prepare tinctures it is clear that errors may creep into any experiment, unless it be made with great caution.

DR. J. DALAND said that the object of his remarks was to elicit some discussion. The observation made, however, in the one case was interesting, because a man taking sixteen minims of digitalis four times a day over a period of ten or eleven days ought ordinarily to show some effects. It is probable that the percentage of cases immune to the influence of digitalis is not a large one. The experiments reported were not carried out to their full determination; and too much importance is not to be attached to the results.

## ACCURATE MEASUREMENTS FOR SCOLIOSIS.

JAMES K. YOUNG, M.D.

[Read December 8, 1897.]

In order to observe the course of the deformity, and the influence of treatment in cases of scoliosis, scientific methods of measurement must be employed. Many methods have been devised to measure and record the amount of deviation of the spinous processes in cases of scoliosis,

and the amount or degree of the rotation of the bodies of the vertebræ. These methods include at the present time upwards of thirty-three different appliances, all of which are mentioned in the appended table.

These include all procedures, from the

simplest free-hand drawing to the most elaborate and precise mathematical instruments. The taking of plaster casts of the body is tedious and cumbersome; the camera obscura reproducing only a portion of the deformity, and photographic reproductions are variable for obvious reasons; so that mechanical devices offer the best methods of illustrating the deviations.

The methods that I have employed until recently are the lead measuring strip, free-hand drawing, the cyrtometer, photography, McLaren's measurements, Weigel's trolley machine, and Beely's scoliosometer. Of these the cyrtometer is simple and reliable, and the Beely's scoliosometer is satisfactory, but could be improved by attaching it to a table. The methods that I am using at the present time are Sargent's anthropometric measurements, photography through a screen, Bradford's scoliosometer, and the improved trolley delineator and rod scoliosometer, which Mr. Thomas Elkinton has kindly placed at my disposal.

First.—Sargent's charts.—The advantages of this system of measurements are that they give not only the average measurements for the given age and weight of the individual, but the two sides of the body may be compared and any defect or

unilateral development may be readily detected.

Second.—Photography through a screen.—This method is not original, having been employed in Boston, but the idea of photographing, first, lines upon sensitized paper, and, second, photographing the patient upon the same paper, was independently devised by Dr. Jos. M. Spellissy, one of the assistants at the Hospital of the University of Pennsylvania. This method, however, requires more time than the simple method of photographing directly through a screen made with threads. Photography of this kind requires that the position of the stand, screen and patient remain unchanged, and each subsequent picture is to be taken in the same manner. I have rendered the screen more useful by indicating the central cross section by a knot, or two oblique threads, this point being placed exactly opposite the sixth dorsal vertebra, or on a corresponding point of the front of the body, to be located with the spirit level.

Third.—Bradford's scoliosometer.—This instrument<sup>1</sup> is the most accurate device for measuring the degree of the deformity due to rotation of the bodies of the vertebra. It consists of two arms, a

<sup>1</sup> Made for me by Dr. Howard Reed, Assistant in the Hospital of the University of Pennsylvania.

TABLE OF SCOLIOSOMETRY

I. Pliable reproduction	1. Plaster cast	
	2. Model bandage (Beely)	
II. Perspective drawing	1. Free-hand drawing	
	2. Photography	
III. Measuring	1. Simple measuring of the body	Measuring Band
	2. Outside measuring of the body	Callipers Spirit-level Pliable metal band Scoliosometer (Heineke) Scoliosometer (Mikulicz) Simple Co-ordination Apparatus (Weil) Measuring apparatus (Bigg) Disastropometry (Roberts) Scoliosometry (Zander, Bradford) Cyrtometer Lead strip Tin strip (Roth) Rod-cyrtometer (Beely, Elkinton) Glass Table (Bährings) Scoliosometer (Grameko) Tachygraph (Rausch, Weigel) Camera obscura (Schildbach) Notograph (Virehow, Elkinton) Scoliosis Gauge (Barwell) Scoliosometer (Schulthess, Scudder) Thoracograph (Biondotti, Socin and Burkart, Schenk)
IV. Profile drawing	1. General surface-measuring	
	2. Special surface-measuring	

scale and a spirit-level. It is placed on the body with the two arms together, and the rod containing the spirit-level is elevated until the horizontal is reached, when the degree may be read off.

Fourth.—The improved trolley delineator.—This is an improvement on the Weigel machine, and is so arranged that outlines may be taken in the vertical and horizontal planes. The paper is on a continuous roll and the tracing may be taken either with a wheel or with a point. In either case the personal element enters into the taking of outlines.

Fifth.—Rod scoliosometer.—This machine is not unlike the scoliosometer of Beely, but it has one advantage in that it is attached to an upright. Two points upon the spine, the seventh cervical vertebra and the top of the coccyx, are fixed against two rods of the machine, against which the patient leans. The rods are pushed in singly and marked upon the chart. Any deviation is indicated upon the chart, which has square tracings upon it. The personal element also enters into this method.

## DISCUSSION.

DR. R. H. AUGUSTUS WILSON said that unfortunately the accuracy of the machines spoken of would appear to condemn them, because their great accuracy is used to measure an exceedingly inaccurate and constantly varying subject. In the Weigel machine the metal wheel that passes over the patient, if she is at all sensitive, and often most patients are, so tickles her back that she will unconsciously move, bringing into prominence one side or the other and completely altering the record. Another element of possible error is the personal one. Considerable experience is necessary to make use of the machine in order to rather definitely locate the spinous processes. Occasionally the bars of the upright machine will touch a point where there are no spinous processes, and make a deeper impression than is warranted by the location of the spine. Besides, it is almost impossible to keep the patient quiet and the angle varies so that it is impossible to secure accuracy. Mr. Bernard Roth says that the Weigel machine is too accurate for an inaccurate subject and he has gone back to the old block tin table, because he found that it gave sufficiently accurate records to carry an analysis of existing conditions from time to time.

Anyone who has watched a patient being measured must have noticed movement of the spine from the respiratory act, and it is impossible to guard against this. If the chest is at all movable it will so disturb the spinous processes as to make the record valueless. As yet there is no machine that will so elaborately measure as to do away with the inaccuracy due to these movements. Photography is at the present time the least likely to false interpretation of any of the methods employed. It will delineate lines that are not shown by the machine.

DR. BERTHA LEWIS said that according to the method of taking measurements adopt-

ed by Mr. Bernard Roth, of London, the patient stands in front of the physician in an erect posture. The trunk is then flexed, the arms hanging, the hands placed lightly on the knees, which are kept extended. This position relaxes the posterior scapular muscles and carries the lower angles of the scapulae as far away from the spinal column as possible, and throws the osseous deformity of the ribs into prominence. Now the left-hand end of a pliable tin tape is placed at the lower angle of the left scapula, while the tape is carefully molded close to the ribs across the spine to the lower angle of the right scapula. With a pencil the metal tape is marked opposite the dorsal spine. Next the tape is carefully lifted upon a sheet of paper, previously prepared, and a tracing is made from the inner surface of the tape upon the paper. A second measurement should be taken about the loins midway between the last ribs and the iliac crests, opposite the third lumbar vertebra. This gives a complete record of primary and compensatory curves. These very simple and quickly taken records are sufficiently accurate to show the progress of cases. They faithfully show the alterations in the bony structures, and also the growth in muscle-masses. No system of measurements will accurately record the restoration of function of both spine and muscle that follows, when cases of rotary lateral curvature are treated by medical exercises under the careful personal supervision of the physician.

DR. YOUNG said that he considered the Bradford machine the very best machine, and he advised it for taking the rotation of vertebrae. The diagrams are made with the body in the prone position, and the clavicles firmly fixed on the bed. This is the only method in which the body can be firmly fixed. It is true that the machines are too accurate for ordinary purposes, but for general office work, in the most particular

cases resort must be had to the most particular methods and it is a good rule to use the most accurate methods to be obtained in the most difficult cases.

In regard to photography, the picture-screen must be placed in the same position, the same lens must be used and everything

done in the same manner each time. The methods of Roth include the use of a simple lead strip. In office work Dr. Young is in the habit of taking free-hand drawings with notes upon the case. If anything more thorough is desired, resort is had to the other methods.

## THE TREATMENT OF TUBERCULOSIS WITH INUNCTIONS OF EUROPHEN.

LAWRENCE F. FLICK, M.D.

[Read December 8, 1897.]

This communication contains a brief statement of the condition and treatment of five patients when they first came under my care and of their condition at the present time. I divide the cases into two classes, those in the incipient stage and those in the advanced stage. By "incipient stage" I mean that condition in which there is as yet no softening; by "advanced stage," that condition in which there has been breaking down and ejection of broken-down tissue. Two of the patients were in the incipient stage and three in the advanced.

Case I. A woman, 26 years old, had been exposed to tuberculosis in her own family for a few years. She came to see me first on September 21, 1897, on account of a pain in the right shoulder-blade. She was not feeling well, but had no cough. She had been chilly a great deal lately. The pulse was 68. She weighed 128 pounds. On physical examination I found impairment of resonance over the upper lobe of the right lung and prolongation of the expiratory murmur in the same situation. I placed her on inunctions of europen and tonics. She has used the inunctions continuously since, but the tonics only at intervals. On November 30 she reported herself as feeling right well. She weighed 131 pounds; her pulse was 72; she had an occasional stitch in the back of the chest on the right side. Physical examination revealed great impairment of resonance on the right side of the chest, but not a normal condition.

Case II. A woman, about 40 years old, went to bed with pleurisy in June. She had been exposed to tuberculosis for many years, her husband having died of this disease. She had been losing flesh for some months previously, but had received no treatment. Physical examination revealed consolidation of the apex of the right lung. The woman was in bed for some weeks, and confined to the house for nearly five weeks. The record of her first visit to my office was made July 3, 1897. She then had improved a great deal, but was still very weak. According to my notes, the lung had not cleared up; the pulse was 104; she weighed 107 pounds; her appetite was fair. She had been using inunctions of europen from the beginning, and had tonics and rest. The treatment was continued. On November 10 it was recorded that the patient had felt pretty well, but she still had pain on deep breathing. The pulse was 72; her weight was 122 pounds; the physical condition of the lung was practically normal. She is continuing her treatment, although she believes herself well.

Case III. A woman, 34 years old, came under my observation in the spring of 1895. My first record was made on May 14, 1895. She then stated that she had been sick for some years. She had a cough; expectorated green sputa, which contained tubercle-bacilli, had impaired resonance over the upper lobe of the left lung; had moist rales and gave evidence of a fair-sized cavity in the apex of the left lung; her pulse was 92; she weighed 131

pounds. My record also says that she had then already gained 11 pounds in weight.

At that time I prescribed inunctions of iodoform and gave her tonics. Some time later I substituted euophen for iodoform, and began with small doses of creasote in hot water. She has been on this treatment, with slight variations and a few intermissions, ever since. She is now, and for more than a year has been, taking 45 drops of creasote thrice daily in hot water. With the exception of one serious interruption, during the spring of 1896, her improvement has been continuous. My last record, on December 6, 1897, states that she had felt right well; she weighed 169½ pounds; coughed a little occasionally; expectorated a little at times; her appetite was good; pulse 96; the physical condition of the lungs was good. When her sputum was last examined, some five or six months ago, there were still tubercle-bacilli present. She is in fair health, and is considered well by many of her friends; and it is only because of her confidence in my judgment that she continues her treatment. I have not been able to secure any sputum for examination recently.

Case IV. A lawyer, about 40 years old, came under my care March 12, 1897, after he had been under treatment by another physician for five months. The man stated to me that during this time his condition had become gradually worse. When I first saw him he had a severe cough, was quite hoarse, had constant spasms of the bronchioles, causing difficulty in breathing; expectorated a great deal, and in the morning was chilly; had a pulse of 88; weighed 141½ pounds; had impairment of resonance over the upper lobe of the right lung, with tubercle-bacilli in the sputum. Under date of March 13, 1897, Dr. Harrison Allen made the following report as to the condition of upper air-passages:

"Swollen arytenoid cartilages and ulcerated nasal septum at the triangular cartilage. It is my opinion that the laryngeal condition is in all probability tuberculous. If there is a deposit in the lungs I would have no hesitation in saying so."

I then placed the patient on inunctions of euophen, small doses of creasote in large drafts of hot water, and a mixture

of pepsin, hydrochloric acid and strychnin, to be taken after meals. This treatment has been kept up since, with some variations, at frequent intervals. The inunctions, with solution of euophen, have been practised constantly once a day, and the dose of creasote has been gradually increased to 40 drops thrice daily. Recently he has intermitted the creasote, however. His condition on December 7, according to his own statement and my examination, was as follows: There is no cough; his pulse is 76; respiration so far as subjective symptoms go, is good; there is very little expectoration; very few bacilli are present in the sputum; there is slight nasal disturbance; the resonance over the upper lobe of the right lung is much improved; his weight is 168½ pounds. So far as subjective symptoms are concerned, the patient considers himself practically well, and he has been attending to his professional duties regularly during the summer.

Case V. A man about 25 years old, came under my care on June 18, 1897, after having been under treatment for a couple of years; and for the attack from which he was then suffering, for about three months. I found his condition as follows: There was marked impairment of resonance and prolongation of expiratory murmur over the upper lobe of the left lung; slight impairment of resonance over the apex of the right lung, with some prolongation of expiratory murmur near the spine. The man was frequently chilly; he coughed and expectorated a good deal; the expectoration was sometimes stained with blood; he weighed 141 pounds; his pulse was 84; his appetite was good. Tubercle-bacilli were present in the sputum. I placed him on inunctions of euophen, gradually increasing doses of creasote and tonics. He is now taking 35 drops of creasote in hot water thrice daily. His condition on November 29, 1897, was as follows: He feels right well; coughs very little; has not expectorated for a week; he has not been chilly; his pulse was 72; he weighs 151 pounds; the physical condition of the lungs was nearly normal. A few days subsequent to this date, on December 2, he had a slight cough and spat up a mouthful of bloody sputum and a few mouth-

fuls of thick, whitish sputum. He promptly reported himself as not feeling so well, and physical examination revealed some moist rales in the upper lobe of the left lung. His weight had, however, gone up to 152½ pounds. A microscopic examination of the sputum showed a few tubercle-bacilli in the whitish expectoration and almost a pure culture of bacilli in that stained with blood. This latter probably came from a small nodule that had softened. The patient presents the appearance of fair health. I saw him to-day and he felt very well. His weight has gone up to 154 pounds and cough and expectoration have ceased.

I now use euphen in preference to iodoform because it is not offensive to the smell, and I believe it to be richer in iodine than iodoform. So far as I can formulate a theory in regard to the mode of action of the drug, I would say that as the euphen is absorbed by the blood, it breaks down and gives off nascent iodine. The chief advantage of medication by inunction lies in the gradual and continuous setting free of iodine in the blood.

In incipient cases I use the inunctions of euphen alone, with tonics. In advanced cases I give large doses of creosote in addition. I am inclined to think that the farther the case is advanced the more strongly is the use of creosote indicated.

The cases presented are fair examples of my results with this treatment. Many of my cases recover a fair state of health, but I have not yet found a way of mak-

ing their recovery permanent. There is a very strong tendency on the part of cases of tuberculosis to relapse, and I am somewhat skeptical about the permanency of cure in my cases. As far as my experience goes, a cure cannot be absolutely relied upon, even after some years of apparently perfect health. I have had a number of cases in which perfect recovery had taken place so far as could be judged from either subjective or objective symptoms, and in which some years subsequently death took place as a result of acute tuberculosis in some part of the body.

In cases of incipient tuberculosis I believe euphen to be practically a specific. All the incipient cases that I have treated with it, probably eight or ten in number, recovered. Some, however, have had relapses, and, as already stated, died subsequently of acute tuberculosis.

Of the advanced cases many do very well, and at least one has been restored to perfect health and has remained well for five or six years. The great difficulty in the way of curing tuberculosis lies in the amount of persistence on the part of the patient. Very few patients are willing to keep up the treatment long enough to insure permanent cure, and especially is this true when they feel well and believe themselves to have recovered.

The foregoing report is made for what it is worth. Each must judge of it for himself. The best way to arrive at correct conclusions is to try the treatment. As far as my own judgment goes, it is a most valuable aid in the treatment of tuberculosis.

## DISCUSSION.

DR. M. B. HARTZELL pointed out that euphen has been largely used in the treatment of cutaneous affections. Not a single case of lupus vulgaris has been reported in which the treatment has been followed by cure, nor have any of the so-called scrofulodermita been cured by this means alone. From personal observation Dr. Hartzell believed that the use of large doses of iodine is likely to be followed by disastrous results in this class of cases. In the case of a young woman who had a large ulcer, scrofulous in character, to whom the iodids were administered in large doses, rapid breaking down and bad results followed closely. If then in tuberculosis of the skin, where the conditions are so favorable for the application

of the remedy, no decided curative effects have been obtained, one may doubt greatly the wisdom of administering internally this remedy in the treatment of pulmonary tuberculosis.

DR. HENRY BEATES, JR., asked whether in the cases reported the good results obtained were to be attributed to the inunctions of euphen or to the use of creosote and other remedial agents.

DR. L. J. HAMMOND asked whether there is a known quantity of iodine contained in a definite amount of euphen, and if so whether it would not be possible to use the iodine itself by inunction rather than the compound?

DR. H. A. HARE said that if the method recommended by Dr. Flick is employed to any extent definite information should be forthcoming as to the class of cases in which it is most useful. What Dr. Hartzell has said in regard to iodine compounds rendering certain scrofulous or tuberculous conditions much worse is worthy of attention. It can readily be understood that in cases of incipient tuberculosis when the condition chiefly depends upon a catarrhal process, the administration of the iodine could be very beneficial indeed, because the administration of iodine compounds is useful for any catarrhal condition. But when tissue is breaking down rapidly in a tuberculous or other process in which necrotic change is taking place, the iodids must be employed very cautiously or not at all. The employment of iodine compounds might be dangerous treatment to institute in all cases of tuberculosis, particularly in cases in which cavity-formation is marked or in which there is an excessive catarrhal process in addition to cavity-formation. In bronchorrhea the iodids cause tremendous outpouring into the bronchial tubes and do harm rather than good.

DR. FLICK maintained the belief that the euophen or the iodoform was the most important factor in the treatment of the cases reported. He has long been convinced that iodine is the best remedy for the treatment of tuberculosis and better results are obtained from inunctions of euophen or of iodoform or any other iodine compound that gives off its iodine readily, because of the constant effect. Dr. Flick held that the use of iodoform-inunctions is probably attended with the setting free of iodine in the blood, which produces the beneficial effects. It is the iodine and not the creosote that gives the results, first, because most of the cases reported were treated for quite awhile by other men with the same treatment, except the euophen. The creosote was used, the tonics were used, almost everything available was used except the euophen. Secondly, hospital cases subjected to treatment with inunctions and tonics and food exclusively also did well.

In advanced cases the creosote is an im-

portant factor. The farther the case is advanced the more freely is the creosote to be used. Iodine itself would not give as good results as euophen or iodoform, because it is the nascent iodine in the blood from the decomposition of the euophen or iodoform that gives the results. It is a question whether this effect can be secured in any other way than by inunction of an iodine compound. Besides the constant effect from these inunctions the gradual absorption and decomposition of iodoform and euophen must count for something.

The more incipient the case, the better the results. Some of the cases that recovered had relapses and died of miliary tuberculosis subsequently. In ten or twelve cases seen in the last few years, in which no softening could be determined to exist all of the patients were restored to health, for the time being at least, as far as could be determined by physical signs and subjective symptoms. Hemorrhagic cases will probably do better than non-hemorrhagic.

DR. JAMES TYSON expressed the opinion that Dr. Flick had stated his case modestly and fairly. Great moderation and caution are called for in deciding therapeutic questions of this kind, but the treatment commends itself for trial in view of the great importance of the subject. Dr. Tyson attempted to use the iodoform in this way several years ago, but a great obstacle to its use was the extremely offensive odor of the drug. The absence of such odor in the case of euophen removes this difficulty. Of course a large number of cases must be treated before any decision is arrived at. But the difficulty is no greater in deciding as to the merits of inunctions of euophen in connection with codliver-oil and creosote than in deciding between the merits of codliver-oil and creosote used separately. By the aid of a large number of cases and a general survey of the ground many are convinced that treatment with codliver-oil and creosote is more useful than treatment with codliver-oil alone. In like manner treatment with inunctions of euophen, codliver-oil, and creosote may prove more useful than treatment with codliver-oil and creosote only.



## THE INFLUENCE OF DIGITALIS ON THE HEART-MUSCLE WHEN ADMINISTERED FOR A LONG PERIOD OF TIME, WITH A MICROSCOPIC STUDY AND REPORT.

H. A. HARE, M.D., AND W. M. L. COPLIN, M.D.

[Read December 8, 1897.]

This paper is based upon a series of experiments designed to determine whether digitalis when administered for a considerable period of time actually increases the development of the heart-muscle. There is probably no drug that has been studied more thoroughly at the bedside and in the laboratory than digitalis. Ever since its employment by Witherington, and his classic reports upon its clinical uses, clinicians have relied upon it as one of their most valued medicaments. Particularly is this true with relation to diseases of the heart in its valvular forms when compensatory hypertrophy has not taken place by natural processes. Laboratory investigators also have studied the drug exhaustively by every means and form of apparatus, so that we know something of its physiologic effects as produced by the administration of single and multiple, or large and small doses, when they are given within a period covering a few hours.

While we know certain facts about the acute effects of digitalis, if I may use such a term, we know little or nothing of what might be called its chronic influence over the heart-muscle itself. It is true that a multitude of clinical observers have found the prolonged use of this drug in proper doses to produce an increase in the force of the apex-beat of the heart, an increase in arterial pressure, and a slowing of the pulse-beat, but though these effects are explained by the known physiologic influence of the drug the question as to whether the continuous use of digitalis really strengthens the heart has been undecided. By the term *strengthen* I do not refer to a temporary increase of power produced by stimulation such as follows the use of alcohol or ammonia, but a condition in which by reason of increased muscular development the heart is actu-

ally increased more or less permanently in its muscular development and ability to do any extra work that may be thrown upon it.

With the experiments made to determine whether digitalis increases the size and force of the pulse-wave by influencing systole or diastole I shall not deal, nor will I speak at this time of the effects of the drug upon the nervous supply of the heart and the trophic influences that govern its nutrition, although it is probable that through these influences the effects obtained by its use are in part brought about.

When digitalis is given to a patient with cardiac disease and death takes place, the post-mortem examination usually reveals an increase in the development of the heart-muscle, and it has been customary to attribute this solely to the effort made by the system to establish compensation by hypertrophy. The experiments about to be detailed would seem to prove that the increase in muscular development may be in part due to the drug, and explains why it is that digitalis is so much more effective in most cases of valvular disease with failing compensation than any other heart-stimulant or heart- tonic, for all the others seem to have, and probably do have, but a temporary stimulating effect.

In a brief paper entitled "The Choice of the Various Preparations of Digitalis," published in the *Therapeutic Gazette* for August, 1897, I pointed out the fact that digitalin, digitoxin, and digitalein are the principles of digitalis soluble in alcohol, and that they are also the principles that chiefly stimulate the heart-muscle, the digitalin also stimulating the vagus nerves. On the other hand digitonin depresses the

vagus nerves and is insoluble in alcohol. By reason of this fact it is manifest that when we desire to aid the heart in cases of valvular disease we should use an alcoholic preparation of digitalis in preference to any other pharmaceutic product or even the powdered drug itself, and this may be accomplished by employing the tincture, or better still, a tested fluid extract that is of known and definite strength.

The experiments were carried out as follows: Search was made for a litter of ten pigs in which each pig would be, at the time of starting the experiment, about the same in weight and degree of development and in good health. Such a litter having been found of the age of two months, each pig was weighed and the lot divided into two batches of five each, one of which was to serve for control-experiments, while the other batch was to receive ascending doses of digitalis. Care was taken in making the division that for each pig placed in batch No. 1 another of, as nearly as possible, the same size was placed in batch No. 2, so that there might be no difference in size between the control-pigs and those that were to receive the drug. As far as possible an equal division was made also as to sex. The pigs in each batch were then marked by lead tags inserted in their ears, so that in the event of their escaping from one pen to the other no confusion would arise. The two sets were then placed in two pens side by side and provided with separate feeding-troughs so constructed as to prevent spilling of the contents as much as possible. Precisely the same manner of feeding was employed for both sets, the food being first prepared in one receptacle and afterward divided into two equal parts, to one of which, that designed for the second batch, were added ascending amounts of normal liquid digitalis prepared by a thoroughly reliable firm, a fluid extract that is as nearly as possible a standard preparation containing the active ingredients of the drug, as each package of the crude drug is first tested by physiologic methods before it is prepared for the market. This physiologic test is the only one that can be satisfactorily employed to determine the probable therapeutic activity of a given sample of the drug over and above those commonly resorted to by

pharmacists and chemists who estimate the probable value of a given fluid extract or tincture by ascertaining the amount of extractive, which indicates that the crude drug has been properly exhausted. It is not possible at present to make a chemic assay of digitalis.

Before the experiment began the pigs were weighed and were described as follows (January 2, 1897):

*Control-Pigs.*

	Weight.
No. 1 (boar).....	35 lbs.
No. 2 (boar).....	36½ lbs.
No. 3 (sow).....	39 lbs.
No. 4 (sow).....	39 lbs.
No. 5 (boar).....	40½ lbs.
Total weight .....	190 lbs.

*Digitalis-Pigs.*

	Weight.
No. 1 (boar).....	37½ lbs.
No. 2 (boar).....	35½ lbs.
No. 3 (sow).....	38 lbs.
No. 4 (boar).....	31 lbs.
No. 5 (boar).....	43 lbs.
Total weight .....	185½ lbs.

The first dose of digitalis was given on January 14, 1897, owing to delay on the part of the apothecary who had sent for the particular preparation demanded. The dose was ten minims of the "normal liquid" named, given to the five digitalis-pigs night and morning, or approximately two minims to each pig twice a day. The dose of the same preparation for man is from one to three minims a day. On February 14, one month later, the dose was doubled, and on March 14, two months later, trebled (thirty minims). On April 3 it was raised to forty minims, and on April 17 to fifty minims. In other words, each pig received about ten minims twice a day after this time. As the weight of the pig was much less than that of a man, this dose was equal to about between 60 and 100 minims of the fluid extract a day per pig. This is a very large dose, but produced no ill effects owing to the gradual increase of the dose and probably to partial immunity.

As early as the middle of March the farmer in whose care the animals were placed reported that the pigs that were "getting the medicine" were "livelier and bigger than the ones that are not getting it."

On May 2, 1897, about four and a half months after the beginning of the experiment, the pigs were weighed on the same scales and killed by a butcher by an incision across the aorta (hemorrhage) and the hearts carefully removed. The hearts were removed by me and carefully weighed after the cavities had been cleaned of blood-clots by the use of clean water poured through them. The results were as follows:

<i>Control-Pigs.</i>		Weight
	Weight.	of heart.
No. 1.....	78 lbs.	5 oz.
No. 2.....	78 lbs.	5 oz.
No. 3.....	87½ lbs.	5½ oz.
No. 4.....	55 lbs.	4 oz.
No. 5.....	99 lbs.	6¼ oz.

Total weight ..... 397½ lbs. 25¾ oz.

<i>Digitalis-Pigs.</i>		Weight
	Weight.	of heart.
No. 1.....	82¼ lbs.	5 oz.
No. 2.....	83 lbs.	5¾ oz.
No. 3.....	86 lbs.	6 oz.
No. 4.....	70½ lbs.	5½ oz.
No. 5.....	95½ lbs.	6¼ oz.

Total weight ..... 417¼ lbs. 28½ oz.

It will be seen from this record that the total weight of the control-pigs is less by about twenty pounds than that of the digitalis-pigs, and that the hearts of the control-pigs weighed less by 3¼ ounces than the hearts of the digitalis-pigs. It is true that in No. 1 and No. 5 of the digitalis-series the hearts weighed the same as those of the control-pigs, but on the other hand it is a fact that control-pig No. 5 weighed more than digitalis-pig No. 5.

While these results, so far as the weight of the animals and of the hearts is concerned, are not sufficiently in favor of the digitalis-pigs to prove simple cardiac hypertrophy under its use, it is interesting to note that the increased activity of the circulation in the digitalis-pigs resulted in an increase in general activity during life and greater weight by twenty pounds.

The hearts were now placed in separate jars containing formalin solution and shipped to the Pathological Laboratory of Jefferson Medical College, to Dr. W. M. L. Coplin, Professor of Pathology, whose microscopic report is appended, and to whom

I am under great obligations for the careful study that he has made.

#### REPORT.

Specimen of pigs' hearts sent to the Laboratory by Professor H. A. Hare.

Ten pigs' hearts preserved in formalin, strength of solution not stated.

Five specimens were in jars marked with Arabic numerals, and five in jars labeled with Roman numerals; those in Arabic, in addition to the number, had upon each label the word "Digitalis," while those marked in Roman numerals had nothing on the labels but the number.

On macroscopic examination the ventricular wall was very much thicker in the digitalis-hearts than in the others; it also cut with more resistance, and seemed uniformly firmer. The increase in the thickness of the left ventricular wall was very much more marked than that of the right.

The fixation was not perfect, and the deeper layers of the muscles had not been penetrated by the formalin. In order to make a microscopic study of the specimens, pieces were taken from near the apex of each ventricle, and all of the specimens were treated exactly alike.

The blocks of tissue removed were placed in separate containers and each container numbered, the corresponding number being placed in a note-book, with the number of the heart and the number of the specimen, so that during the subsequent examination it was not known whether the observer was working with tissue from one or the other heart.

Each piece of tissue was dehydrated in alcohol, cleared in cedar-oil, infiltrated with paraffin, sectioned, and cemented to the slide, cleared up, stained with hematoxylin and eosin, dehydrated in creosote, and mounted in balsam.

Measurements were made by means of the filar micrometer, the rulings having been previously standardized with a stage-micrometer for 2-3 and ¼ objectives, and a tube-length of 160 millimeters.

The tissue was mounted in two pieces so as to secure transverse and longitudinal sections; three sections were mounted from each block, and three measurements made from each section, the mean being taken for the record; altogether, 270 measurements were made from each series, with the following results:

Of the hearts from the pigs that had not had digitalis the following results were obtained: No. 1, .1166 millimeter; No. 2, .1125 millimeter; No. 3, .0916 millimeter; No. 4, .0833 millimeter; No. 5, .0791 millimeter.

Digitalis-hearts gave as an average of all the measurements: No. 1, .1125 millimeter; No. 2, .1166 millimeter; No. 3, .1208 millimeter; No. 4, .1166 millimeter; No. 5, .1208 millimeter.

It is well known that the size of the cardiac muscular fiber varies widely; the measurements given ranging from .05 millimeter to .25 millimeter. The size of the muscular fiber is alleged to depend upon the activity of the muscle, the condition of its nutrition, and the condition of the muscle at the time of measurement—that is, whether the fiber measured is relaxed or contracted. It is presumed that under nearly all conditions the measurement is made in the condition of contraction, and particularly is this true of a heart in which the cavities are so readily emptied by bleeding, as occurs in consequence of the ordinary method of killing lower animals. Taking into consideration the age of the animal, its general nutrition, the method of killing, and the subsequent contraction of the heart, it is to be inferred that the measurements given were made under conditions favorable to obtaining the highest measurement.

The highest measurement of the normal heart (.1166 millimeter) is higher than the lowest measurement of a digitalis-heart (.1125 millimeter), but the lowest measurement of the normal heart (.0791 millimeter) is far below the measurement of the heart from the pig which had had digitalis (.1125 millimeter).

Taking the sum of the measurements of the five hearts from animals having had digitalis, and deducting from that the sum of the measurements of the five hearts from animals that had not had digitalis, we find that the difference is .1042, which divided by five, in order to reduce it to the unit of one muscle-fiber, gives us a result of .0208 millimeter, which represents the mean increase in size of the cardiac muscle-fiber in the animals that had digitalis.

While this difference, amounting practically to .02 millimeter, strikes us at first

as being very small, when we come to remember that it is between one-tenth and one-fifth the diameter of the muscular fiber under ordinary conditions, it practically accounts for the increase in the size of the heart without the necessity of referring that increase to the growth of new muscular fibers.

Thus, if it can be demonstrated—and the foregoing calculations seem to do as much—that there is an increase in the diameter of the muscular fibers amounting to one-tenth, and if under the administration of digitalis the weight of the heart is increased one-tenth, it would then seem probable that the entire increase would be due to an increase in the size of the muscular fibers, rather than to an increase in the number. If, however, heart No. 1 (digitalis) weighs more than the normal, the increase could only be explained by assuming an increase in the number of the muscle-fibers.

In conclusion I wish to thank Dr. W. P. Read, assistant in pathology, for valuable aid in conducting this rather tedious and prolonged investigation. Dr. Read infiltrated, sectioned, stained, and mounted the tissue; and working together we duplicated all measurements in order to, as fully as possible, control our results. We have separately conducted the calculations for a mean result in each set of measurements in both series, in order to avoid mathematical error, and to further avoid this danger all vulgar fractions were calculated with a denominator of five figures, and decimal fractions to four figures; the results obtained by both systems were acceptable only when they coincided.

The fact that on macroscopic examination the ventricular wall is much thicker in the digitalis-hearts than in the hearts of those animals that received no digitalis, as noted by Professor Coplin, was remarked upon by me when the pigs were killed. This point seems to be of great importance, and its interest is increased by the additional statement that the muscle cut with more resistance and seemed uniformly firmer. Another point of very great interest is that the increase of the left ventricular wall was far greater than that of the right.

In this connection it is of interest to consider for a moment the theory that the

pneumogastric nerves, for which digitalis has an especial affinity, are the trophic nerves of the heart, and if this be so it is not hard to understand why digitalis increases the size of the heart-muscle. Whether this trophic influence be exercised or not it is well known that the effects of this drug upon the heart are such that its muscle-fiber obtains a greater supply of blood with each cycle by reason of the increased force of the systole, the heightened arterial pressure, and the prolonged and increased diastole.\*

### DISCUSSION.

DR. W. M. L. COPLIN said that all of the hearts were treated as nearly alike as possible. An attempt was made to study the subepithelial nerve-fibers lying beneath the endocardium, but unsuccessfully.

DR. HENRY BEATES, JR., said that for a number of years many instances of the various types of cardiac and circulatory disease have been subjected by him to the continuous influence of digitalis in the form of either a definitely determined derivative possessing therapeutic power of a known and unvarying strength, or in a correspondingly established pharmaceutical preparation. In many instances, more than seven years have elapsed, and in one, eleven, during which a derivative, representing the vaso-motor and cardiac stimulating properties of the drug, has been continuously used. In any investigation of this kind it is important to employ a preparation possessing a constant and known strength as proved by physiologic assay, for all digitalis, as indeed all materia medica derived from the vegetal kingdom, exclusive of assayed preparations, is useless when considered from the basis of determining accurate results, by reason of the fact that the active principles contained in any one drug vary in their percentage as well as in their solubility in the menstrua used in their preparation. The derivative employed in the clinical studies referred to is the pure German digitalin of Merck, which represents that property of digitalis, so well known for its profound stimulant action upon the cardiac muscle, pneumogastric nerve and the vaso-motor center, as well as the periphery of this system. In so far as clinical observations demonstrate, under the conditions mentioned, hearts that years ago were very large, by reason of compensatory hypertrophy, and that occupied a still greater area in consequence of the complicating dilatation, are to-day, as proved by physical examination, diminished as to area of dulness. In a very large number of cases of this type, in which

This research would therefore seem to prove that the prolonged use of digitalis is capable of producing cardiac hypertrophy in the normal heart, and if this is the case it is fair to assume that when the drug is given to a man suffering from valvular disease with deficient compensation it must aid materially in inducing compensatory hypertrophy, in addition to any immediate stimulant action that it may exercise upon the circulatory apparatus.

either assayed digitalis, or the derivative manufactured by Merck, has been continuously administered for years in active doses, there is no evidence of hypertrophy having been produced. In no instance has the intermission in the use of the remedy occupied a longer time than two months.

The results of Dr. Hare's investigations demonstrate a degree of hypertrophy under conditions of normality. Whatever the conditions in the porcine heart, in the heart of man the internal and external longitudinal layers on the left side constitute a well-developed muscular wall, while on the right they are simply sparingly distributed. The same nutritional influences having to operate upon two elements, one of which may be represented by two and the other by four, it is very evident that an especial overgrowth is locally more apparent than real. Clinically, under abnormal conditions, the continuous exhibition of digitalis for years, in large doses, and of its preparations, the exact unit of power of which is known, has demonstrated not hypertrophic consequences, but on the contrary, diminution of the abnormally large area. In the consequences of organic valvular lesions, and those of senility, the drug can, and should be used continuously for a long period of time, varying from months to years as the disease requires. The doses must be sufficient to restore the balance of lost equilibrium to the circulation.

Dr. Beates referred to the case of a water-logged man, with a mitral regurgitant lesion, who, after such treatment, was soon enabled to leave his habitually occupied invalid chair and resume the duties of a night-watchman, exposed to all weathers, for five additional years. He lived upon from quarter to half grain doses of digitalin, and during the sixth year finally succumbed, as he would have done many years before but for the bold use of the remedy.

DR. HARE said that he was so intent on getting the hearts intact out of the pigs that he forgot about the kidneys until the hearts were removed.

\* See article on "Digitalis" in Hare's *Trx.-Book of Practical Therapeutics*.

## MEDICAL INSTRUMENTS OF PRECISION AND THE RESULTS OF SOME ORIGINAL WORK.

HENRY EMERSON WETHERILL, M.D.

[Read December 8, 1897.]

### CLINICAL THERMOMETER.

It was Spencer, I believe, who said that we really only know things when we can measure them. I think it is better the more accurately we measure.

The clinical thermometer that I take pleasure in showing, records to  $0.01^{\circ}$  F., and has a magnifying index. The tube has been selected as one having no correction after having been seasoned for several years. A watchmaker's loupe may be used to aid the reading of the vernier. The thermometer is not made just as directed, but does the work intended. The reason for making this delicate one-minute thermometer was to determine slight differences of temperature in physiologic medicine, and in certain clinical cases. When I first began to measure the moisture of the skin as expressed in terms of relative humidity, I had this thermometer made in order to tell slight differences in temperature, using it at that time as a Mason's hygrometer and with the use of Glashier's factors.

There are some objections to the more accurate way of determining relative humidity in clinical medicine, and not the least is the mathematics required in reducing the complicated empiric formulæ, as, for instance, Apjohn's. The calculations may be hastened in their computation by such tables as that of the Weather Bureau, No. 127, issued by the United States Agricultural Department.

To make the method of determination of the amount of perspiration of the human body easy, I began about four years ago to use the hygroscope, especially modified and conveniently arranged for clinical work. The instrument should be standardized by Daniell's, Mason's, Regnault's, or other hygrometer.

In practice a single thermometer corrected and used both as wet and dry bulb thermometer has given good results for

the curve of correction of the instrument.

Exactly simultaneous readings cannot, however, be obtained in this way, and but one thermometer has to be corrected, and there is no difference between the scales of two thermometers.

I will show a thermometer used and made with magnifying index, Fahrenheit and Centigrade readings, and covering a wide range. It is standardized.

### THE HYGROSCOPE.

The hygroscope is placed in the hands for five minutes, protected by a glass cover. The readings are to one per cent. relative humidity.

Other parts of the body may be observed, and the localization of sweating can be determined and expressed in numbers.

A uniform method of procedure is required, but it is interesting to note that relative humidities can be expressed as determined by a wet and dry bulb surface thermometer; by wet and dry bulb thermometer records in closed hands; by thermometers near the surface of the skin, and by using the same method of procedure in the mouth.

The hygroscope may be used uncovered, but to exclude atmospheric conditions and to get the best average method, I have used the glass-covered hygroscope.

A series of many tests on sick and well shows a tendency for the reading to be about 3 per cent. higher in the morning, and curves of change can be plotted, as I here show on charts.

Calculating the change of relative humidity for the diurnal changes of temperature does not wholly account for the diurnal change of relative humidity.

So it is not alone the temperature of the body that causes the change of moisture in the hands as observed throughout the day. The average varies with people, but

fifty per cent. is a fair mean of results so far obtained.

#### CORRECTIONS OF THE INSTRUMENT.

Correction for the curve of calibration is made with Daniell's hygrometer. Parallax causes hardly any error. The error of markings is small. There is no change in the metal spiral in consequence of temperature changes of the body. There are also no changes of the hygroscopic material for temperature alone irrespective of the temperature effect on the relative humidity. The eccentricity of the indicator is adjustable. A small screw at the back of the instrument adjusts the pointer. There are some other corrections, but they are not important.

The effect of the surroundings in general upon the reading is something that will require extensive work, and now I am plotting curves showing effects of the humidity of the air; of the temperature of the air; of barometric pressure; of the thermometer in the hands; the thermometer in the mouth; the temperature, the pulse, the respiration, and many other things which may show their relation in the matter.

In cases of pulmonary tuberculosis there have been some interesting results, and in cases of nephritis also. It is my wish to further continue my studies on different animal species, for as I am told by Dr. Sharp, different species will probably show different results.

Perhaps the instrument may be of some use in recording in a numerical manner a matter that has heretofore been expressed in a more uncertain way, except when great pains has been taken to weigh the

amounts of perspiration; and it is my impression that the relative humidity of the skin, as expressed by the hygroscope, may show a close relation to the amount of fluid lost by the body per day in pounds.

#### MICROTOME.

I thought it might be interesting to exhibit a pocket microtome that has done good service in cutting sections in botany and in medical work as well. It is constructed on the inclined-plane principle, and enables one to cut sections to 1-800 of an inch in thickness.

#### ROTAMETER.

This is used to measure the length of ataxiographs. To express areas of dulness the rotameter is very accurate.

With some certainty one can express the weight of the heart in grams by multiplying the length of the periphery of superficial cardiac dulness expressed in centimeters by the constant 5.6. There are many causes making the results inaccurate, but by using a planimeter working on glass which has the projected area of dulness marked upon it, one gets a more accurate result. The instrument may be used for measuring all surface distances.

#### A SMALL STOVE FOR THE SICK-ROOM.

The stove shown will boil a half-pint of ice-water in four minutes, and when not in use it folds compactly.

With the pyramid candle one can keep milk warm for 12 hours. The lamp is made of spun aluminum.

## SOME PERSONAL OBSERVATIONS ON THE PLAGUE IN CHINA.

WILLIAM F. ARNOLD, M.D.

[Read December 22, 1897.]

I arrived at Yokohama, Japan, on the U. S. Cruiser *Charleston* about the first of October, 1894, and I met Professor Kitasato at his Institute for Infectious Diseases in the course of my first leave of absence from the ship. He gave me a note of introduction to Professor Aoyama, of the chair of internal medicine in the Imperial University, whom I met at his home. This frank and accomplished physician was not at that time fully recovered from the attack of plague that he had suffered in Hong Kong in the preceding June, but he received me most cordially nevertheless, showing me the photographs of the volunteers from the Shropshire Regiment and the sanitary corps cleaning out Chinese quarters, caring for the plague-stricken and disposing of the dead. He recounted his experience and his observations of the malady, and recalled with grim humor the preparations that were made for his burial. At the end of my visit he insisted upon my accompanying him to his laboratory at one of the general hospitals of Tokyo, where he showed me many of the specimens secured in Hong Kong.

I embedded some of the material given me by Aoyama upon my return to the ship (using, instead of the convenient oven of the laboratories, a portable electric drop-light covered over in the stationary wash-basin in the stateroom of an absent messmate); and I finished some sections at the lower end of the Japanese Empire about a week later, after my transfer to the smallest gunboat that our government keeps in commission. They served to convince me that the plague-bacillus decolorized by Gram's method, and led me to doubt at that time the thoroughness of Kitasato's work in connection with this organism. He had demonstrated it to me in the course of my call upon him, but the cultures that I saw at that time were far from exhibiting the luxuriant growth that I have not failed

to find it show in other hands. The English-speaking assistant in the Institute failed to secure a satisfactory cover-glass preparation from a culture on blood-serum, and the specimen exhibited was a mounted slide of blood. Subsequently I never saw any cultures of plague at the Institute, although I asked to see them repeatedly. I was told at length that only Professor Kitasato had to do with the organism, and eventually he himself ignored a written request—in German—that I sent to him through the Legation of the United States in Tokyo, as he did also an application to have him supply the Marine-Hospital Laboratory at Washington with his cultures of the organism.

I am at pains to relate these matters thus minutely here because a late number of *Science* claims that substantial differences exist between Kitasato's organism and that of Yersin. Briefly, the peculiarities given for the bacillus of Kitasato are: (1) Its positive staining reaction by Gram's method; (2) its smaller size; (3) its active motility.

My observations have been confined to cultures obtained in July, 1896, through Yersin, then at Hong Kong, from Dr. M. Wilm, of the Imperial German Navy, who spent some months of 1896 in the employment of the Colonial Government of Victoria (Hong Kong). These cultures show motility in bouillon, and the medium does not clear by sedimentation as with Fehleisen's coccus—as Yersin contends. Otherwise, I can confirm everything that Yersin states. Passed Assistant Surgeon H. D. Geddings, of the U. S. Marine-Hospital Service, quotes Roux as emphasizing the importance of decolorization by Gram's method. The same observer states that the organism is not motile. Some cultures derived from those that I brought to the United States were taken to the Pasteur Institute in Paris by an American under instruction at that institution, but unfortunately they yielded only staphylococci



with which, presumably, they had become contaminated.

Plague-cultures seem to require renewal about every three weeks, and this does not require, in temperate and subtropical latitudes, the use of a thermostat. The organism grows as freely at room temperatures as any pathogenic bacillus, possibly more freely than any other of the class. Its growth is attended with intense acidity, which is often sufficient to destroy contaminating molds. Pathogenesis appears to be readily lost. The bacillus survives under ordinary conditions about six weeks. Morphologically it resembles closely the bacillus of chicken-cholera.

The first cases of plague that I saw were at the Kennedytown Plague Hospital, in a suburb of Hong Kong, early in February, 1896. There had been but a few cases—44, I believe—in 1895, following the 2,550 reported deaths in 1894. About thirty deaths occurred in January, 1896; and the number of deaths was increasing so rapidly in widely separated places about Hong Kong at the time that I reached there that the health-official gave up an attempt to segregate persons known or suspected to have been exposed to infection. Many of the first cases that I saw had developed while thus under observation, and a greater percentage of these cases recovered than of any others that I heard of, except Yersin's patients in Canton and in Amoy, who were the first to receive his anti-plague serum.

I considered some early diagnoses by the attending medical officers very impressive; for the objective symptoms of the first stage are, in many cases, neither striking nor unequivocal before the bubo appears. They depended upon the apprehensiveness of the patient, although he did not often express this otherwise than unconsciously by his facies, and much upon the appearance of the tongue. The state of anxiety of the stage of invasion is often soon replaced by an air that is perhaps comparable to the language-clipping stage of alcoholic intoxication. The usual congestion of the face and the constant injection of the conjunctiva add to the deceptive appearances. Moderate fever will be found; the thin, uniform, whitish coating upon the tongue passes rapidly through yellow to brown, and may be further altered by sordes; and the urine

will be slightly albuminous. The usual signs of fever may increase, but the temperature does not often exceed 105° F. in adults. The suffusion of the face deepens in some cases, but I can hardly think that it of itself ever suggested the old name for plague—*black death*—as Wilm surmises. I am convinced that this name arose from the damage inflicted upon the capillary vessels by the toxins of the plague-organism. As an early result of this damage, ecchymoses follow even trifling violence to cutaneous surfaces comparatively hardened by exposure or by use. In more than one case, I saw a Chinaman's temple almost black from having rolled but lightly against the framework of a dhoolie—a covered litter—or from having turned it too heavily upon a bamboo pillow. Pinching between two coins and other methods of counter-irritation that are routine measures in Chinese medical practice made very striking spectacles of the patients of physicians of this school. One could well imagine what would be seen in the bodies of white people dead of the disease; for, even in the absence of all injury, there appears to be a rather greater tendency toward a slaty blueness of the superficies than other corpses show as a rule. This tendency to ecchymosis is constant enough to be of use in diagnosis; unfortunately, like many other symptoms, it may appear late, although not as a rule. Wounds inflicted in this stage bleed very freely. Ecchymosis ceases when suppuration begins.

The early brain-symptoms, such as the half-drunken state referred to, and the delirium, which is but rarely severe in the Asiatic, are probably effects of the action of this toxin. I saw acute mania follow a comparatively mild extension from the primarily involved axillary glands of the presumably specific process to other chains of lymph-nodes. It occurred in the course of an otherwise uneventful convalescence from a mild attack of plague in a young and vigorous Chinaman. His axillary bubo had been incised some days previously, when the accessible lymph-nodes about his neck showed slight enlargement. His temperature rose above the oscillations through feverishness that are customary in convalescents from plague and remained for a few days about moderate fever; indican appeared in his urine after having

previously disappeared, and it persisted throughout this seizure in spite of free catharsis. For three or four days the patient presented the unique picture of a superlatively joyful Chinaman, with the stolid gravity of fellow-patients and of attendants of his own race for a very effectively contrasting background. Often it appeared almost grotesque to see what had been but lately a splendid specimen of physical manhood restrained to a light cot of bamboo by a turn or two of a bandage across the chest, but it was a ready measure of how easily the disease destroyed the capacity for exertion.

Before leaving altogether the question of the effects of the toxins of the disease, it should be said of what have been described specifically as the plague-spots—the *tokens* of the middle ages—that Lowson and Aoyama have established that they follow the bites of mosquitoes, of vermin and even of flies. The latter are quite equal to the task of penetrating man's integument in a Hong Kong summer, and the changes that take place about so slight an injury constitute the lesion. I did not observe these petechiæ in a single instance, but I was not at Hong Kong in the season of activity of these pests. In 1894, the greater portion of the cases fell within this time, however, and the sufferings of the plague's victims were greatly increased by them.

Ordinarily the course of a case of typical plague does not impress one as being a severely painful experience. The limb whose base shows a bubo will be disposed so as to avoid tension over it; there may be great restlessness; and epigastric uneasiness seemed to be nearly constant. There was, however, little complaint of persistent pain.

In a large proportion of cases the temperature keeps near the elevation it first reached for from one to three—rarely more—days. The pulse loses force and soon shows the quality described as running; it is often dicrotic. Many irregular symptoms may appear as the end approaches; this usually comes through circulatory failure, and a greater part of the cases die within the first four days of illness.

There is a class of cases that increases in number as an epidemic of plague progresses, whose subjects present no initial

buboes. They seem now to be called pneumonic cases, but the reason therefor is not quite plain to me. It is, of course, probable that I have not seen the clearest type of them, such as the early cases of *mâhâ-mari* or those more lately described at Bombay. The recollections that current descriptions bring to me are of patients overwhelmed by infection through the gastro-intestinal tract. None of these cases recovers, as I believe. I saw but very few of them while they were alive, and I could not obtain any satisfying accounts of the symptoms. But I saw so little that suggested primary or even important pulmonary involvement that I am at a loss to understand its prominence elsewhere. For all of that, some experienced and most observant individuals have most wholesome fear of the dust from rooms occupied by plague patients.

Two cases of plague without buboes that I knew of received most excellent medical attention from the very beginning of their illness, but the blood of neither of them showed the bacillus during life, and only the autopsies confirmed the tentative diagnosis.

The buboes, which have served to characterize this disorder more strongly than all of its other symptoms combined, are the nodes receiving the lymph-vessels or material from spaces inoculated with the plague-organism. Nearly all of the superficially situated lymph-nodes have been found at one time or another to constitute buboes. The anatomic situation of these nodes influences materially the character of the buboes. Thus the mesenteric glands, even in cases of intestinal infection, rarely are markedly hemorrhagic, and they are but moderately enlarged; while the lymph-nodes of the pleura and the mediastinal glands seem to be even less influenced. If the patient have survived for several days, it is usual to find that all of the lymph-nodes of the body present appreciable changes in appearance; but it is unusual to see hemorrhagic inflammation, except in a chain that has been infected from without. The tendency to small hemorrhages in almost every vascular part is constant in most cases and renders difficult the accurate determination of the limits of lymphatic involvement.

Probably the most striking feature of these buboes is the large number

of bacilli present in and extending outward from the lymph-sinus of the node. The enlargement of separate nodes is attained as in ordinary inflammation and is added to by the hemorrhage and the wonderful multiplication of the bacilli. Large masses may be met, but they are due to the matting together of separate nodes that may be made out individually in the early stages of their implication. Frequently the uniting substance is gelatinous in character, and occasionally the mass may slough out. I did not see a carbuncular bubo, nor an ambulatory case of plague.

Exudation, in the form of a localized edema, involves the tissues over and about primarily affected nodes. This often leads to erroneous ideas of the size that is attained by the affected nodes on palpation. I soon learned that I could never be sure of what I should find upon section, and this was the more true when fat cadavers were concerned. This edema was extreme in some bad cases. The fluid sometimes appeared blood-stained, but much oftener the swelling was permeated with straw-colored serum, while the node beneath it was intensely hemorrhagic.

The presence of hemorrhagic inflammation in lymph-nodes was accepted as the pathognomonic sign of plague. Doubt in some cases was resolved by the aid of smear-preparations from the spleen.

The bubo suppurated in all but the mildest cases of plague. I think that the pus of plague is characteristic. It is unusually thick, if its recent formation be taken into account, very tenacious, grayish in color, and not often very abundant. It has been shown that the plague-bacillus is a pyogenic micro-organism. Mixed infections are very common; perhaps they present more variations than many other acute infectious processes can show. Pyogenic cocci are present very early in some cases; often they appear to replace gradually the plague-bacilli in incised buboes. Streptococcal infection was indicated oftenest to me by complications that were clinically indistinguishable from erysipelas. Wilm claimed to identify streptococci by morphologic appearances.

Some cases seemed to present an early general suppurative tendency affecting many tissues and soon reducing the sufferer to an awful extremity. I have some

gruesome recollections of extensive diphtheria-like ulceration of the fauces, of purulent keratitis, of purulent synovitis and of early abscesses superficially distributed for the most part, but wonderfully numerous. Similarly microscopic abscesses are common in organs that seem without gross lesions.

Autopsies complete from the bacteriologic standpoint will be required to classify many of the incidents of the disease.

One must use, for a fixed point around which to gather sufficient details for a mental picture of the disease, one of the hemorrhagic septicemias of lower animals. Glanders furnishes perhaps the nearest parallel, although it is by no means close. Like glanders, however, the infection is received through either a wound or an unbroken mucous surface. I was able to kill rabbits by pencilling scrapings from buboes into their conjunctival sacs—using the utmost gentleness to avoid making abrasions, death taking place from eight to ten hours earlier than in control rabbits that had been inoculated subcutaneously with the same material.

There is a strong presumption in favor of a direct relation in men between the great preponderance of inguinal buboes and infection through the genital tract. Although the word bubo is restricted in application to the inguinal region, save only in this disease, I am not aware that this relation has been noted prior to March, 1896, at which time I suggested it to Dr. James A. Lowson, of the Government Civil Hospital at Hong Kong, and he brought it up for consideration at a meeting of the Hong Kong Local Branch of the British Medical Association, at which I attended as a visitor on March 13th. I read there an account of my efforts to connect buboes in about 70 cases with injuries and with other possible sources of infection, but the histories were too meager to furnish any good results. I stated upon that occasion—what I still believe—that the act of urination affords in men opportunity for infection with plague through inoculation of the urethral mucous membrane with contaminated fingers; for the fewest number even of the neatest of men take precautions to obviate infection by this means.

It is an old observation that cervical buboes predominate in children, and this

distribution is explained by their habit of putting things of various kinds into their mouths. In Hong Kong in 1894, the Chinese women furnished a proportion of victims beyond that commensurate with their relative number. The fact is well explained, I think, by their practical confinement within infected quarters by reason partly of inexorable conventionalities and partly of the deformity of their feet, inflicted, possibly, to enforce conventionality.

An unusual element is introduced into consideration of plague-epidemics, as Yersin was quick to perceive, by the spread of its virus through such ordinarily insignificant agents as rats, flies and possibly other domestic pests and pets. Practically all of his claims have been confirmed lately by Nuttall. Dr. E. H. Wilson, of the Brooklyn Health Department, has repeated one of Yersin's experiments, with an important variation and an interesting result. He introduced into a jar whose bottom was covered with dry oats a number of healthy mice and a number inoculated with plague-bacilli. No infection of the well mice by those that had been inoculated took place, although the latter all died. In Yersin's experiments no drying material was used and some of the healthy mice become infected. Wilson's experiment indicates the slight resistance of the plague-organism to drying, and it may explain in part the infrequency with which the disease prevails in dry weather. The facility with which rodents acquire the disease is a new danger in large communities, inasmuch as few municipalities are prepared to disinfect the places accessible to their rat population.

The immunity of the large river-population, as the hordes who live in small boats on the water-ways of Canton are called, and the disinclination of the disease to descend water-courses whose trade is small and inconstant, owing to rapids—such as the upper Yangtse and the formative tributaries of (Canton) West River—may perhaps be due to the influence of dryness upon the organism. Plague has ascended the latter stream, but quite slowly; yet the disease has existed for years upon its upper branches. As yet it is not known to have followed along the Yangtse, although it was not far from this stream that it was first seen by Mons. E.

Rocher in January, 1871. He was, I think, the first who recognized the true character of the disease in this region. Its introduction into Yunnan was very probably from the Nepaul frontier, where it is known to have existed since 1848. It came, in all likelihood, by caravan through Bamo along a trade-route that is little known to modern European explorers, during the course of the Mohammedan rebellion against the Chinese in Yunnan. This contest raged from 1856 to 1872, and its close was marked by the unimaginable horrors of a Chinese victory. The victorious troops were terribly scourged by the plague, and it seriously affected those first sent from this province against the French in the Tonkin war in 1883. This was soon after its epidemic prevalence about Pakhoi.

The dangers of the spread of plague from the existing foci in India are particularly great at present, owing to the disaffection of the Mohammedans in India, some of whom are the most perfect fatalists on earth. The restriction of the annual pilgrimage has doubtless retarded diffusion of the disease; but the present war with the hill-tribes and the possible effects of Turkey's victory over Greece are hardly encouraging, to state the situation mildly. Russia, Austria and Turkey are the countries threatened directly from extension by land. Persian customs regarding burial present especial dangers there.

It seems very probable that the disease was conveyed by steamer from Hong Kong to Bombay. Other less extended voyages are known to have been made from Hong Kong to Yokohama in 1896, and to Nagasaki in 1894 and 1896; and from Formosa to both of these Japanese ports in the present year. It was introduced into Formosa by tea-pickers from Amoy in 1896. I have little doubt that it is working its way northward along the Chinese coast.

Prompt isolation of affected individuals and the rigid application of the principles of modern sanitation will afford gratifying results whenever and wherever they may be applied. Hence the only danger is that unrecognized cases may be introduced. I think it quite too much to assume that there are favored spots upon which its seeds may not fall, even where sanitation has advanced the furthest. I doubt the existence of racial immunity,

and I am inclined to think that human beings that are insusceptible to plague are quite as few as guinea-pigs that are thoroughly resistant to tuberculosis.

From what I saw of Dr. Yersin's work in Nha Trang, Annam, I am most strongly of the opinion that his serum will retain a very prominent place in the therapy of this most fatal of all epidemic maladies. Recent press accounts of his latest use of it in Bombay indicate that its curative properties are all that he has ever claimed for it; that is, that in ordinary cases, before heart-weakness is pronounced, it will save a percentage of cases equivalent to the death-rate of an ordinary epidemic, or, roughly speaking, about 50 per cent. of all cases.

Those who recover from plague-infection of ordinary virulence—and they will be fewer than 10 per cent. of the number attacked, unless some specific remedy be used—may be expected to show many tedious sequels that require both surgical measures and the best that feeding and nursing can do for their restoration to health. It was in these particulars that nearly all of the benefits accrued from the treatment that the Colonial Government and the citizens of Hong Kong extended liberally to the Chinese. To these measures also is due the reduced mortality that has been reported with regard to Europeans affected with plague. Evidence exists that their death-rate, which is placed at 50 per cent., has been under-estimated.

## DISCUSSION.

DR. BENJAMIN LEE said, with regard to the frequency with which rodents are attacked by the plague, that it has been said that before human beings are attacked it is noticed that the rats become unusually bold, that they come out of their holes and mix among human beings without the dread that they usually evince; and this has been explained by supposing that they were attacked by the disease before human beings were attacked. This leads to the supposition that possibly the infection of the plague is earth-borne, as compared with that of typhoid, for instance, which is rather a water-borne infection; that the germ propagates in the earth, and that its extension takes place along the surface of the ground and in its upperstratum, that which contains a considerable portion of air. One striking fact about the recent outbreak as related in the newspapers has been the very marked way in which the disease has followed lines of travel. Even more remarkable, perhaps, is the curious way in which it jumped about in India over spaces of hundreds of miles; places, to which one might suppose the disease would be conveyed by continuity and the occasional migration of foot-passengers, entirely escaping and the disease appearing in cities hundreds of miles distant. In every such instance, on consulting the map, one will find direct railway communication between the two places attacked.

DR. SAMUEL ASHHURST pointed out that Dr. Arnold's remarks cast very decided doubts upon the accuracy of Kitasato's observations, and lead one to believe that they do not deserve the credence which they received some months ago.

DR. H. E. WETHERILL asked the relative humidity of the air most adapted to the propagation of the plague, as reference had been made to one river region having a dryer atmosphere than another.

DR. ARNOLD said, with regard to the fact of rats losing their natural fear of man and appearing among human beings without obvious fear during the prevalence of plague, that in all authenticated instances they were afraid of man not because they were sick, but because they wanted water and air and took the easiest means of getting them. That the disease in rats precedes the disease in man is probably due to the fact that rats after having their burrows infected become ill in large numbers. The fact that rats die and are found in plague-houses is almost unquestionable. The opportunities for infection among the rats are rather greater than among human beings, but the infection among both probably proceeds simultaneously. As a rat has to live most of his life with his nose within an inch of the surface of the ground, he is more likely to become infected than man. The question whether the disease is earth-borne or not has not been elucidated, but for all practical purposes enough has been learned to show that it is not so, but that the majority of cases are derived from pre-existing cases either in man or in animals; and to consider a certain area as infected through the earth itself beyond the possibility of disinfection simply is hardly a justifiable proposition in the present state of knowledge. There has been a good deal of confusion in this connection from more or less imperfect experiments undertaken to prove the presence of the plague-bacillus in the earth. Dr. Yersin did prove its

presence in dust derived from the rooms of plague-patients, and Dr. Kerr, of Canton, relates that it was found also in dust from a room occupied by a man suffering from plague who had died, and by an attendant who had nursed him. Dr. Arnold stated that he did not think Kitasato has done any work of importance in regard to the plague-bacillus since he published his notice in Hong Kong in July, 1894. That notice is very incomplete, and does not contain even an ordinary description of the morphology and staining of the bacillus. Kitasato states that he was unable to determine whether the organism stained by Gram's method, ordinarily a matter of fifteen minutes' application. He failed also to supply Dr. Arnold and others with specimens for comparative study, and the assumption is reasonable that if he has isolated the bacillus the onus of the proof rests on him.

In regard to the reference to the disease not having descended rivers on account of dryness, it is to be said that ordinarily a small boat affords fewer opportunities for the growth of the bacillus by reason of the dryness of its upper works generally,

and the fact that it is nearly all exposed to light and air that blows rather than actual conditions of humidity. There are no records to determine what the humidity in China is. There is one station for meteorologic observations at Hong Kong and one at Shanghai. There is one climatic condition that influences plague—that is hot and dry weather. It was a tradition for years that plague did not descend to the south of the Indus, so that the plague at Bombay is a great surprise. There have been statements that it did not prevail south of the Tropic of Cancer, but these are negated by its prevalence in Hong Kong, which is just about on the line of the Tropic. It has been also stated that the disease prevails in Africa, although there has been an idea that it did not prevail below the isothermic current of 60°. Many generalities like these have been dispelled, and Dr. Lowson, whose practical knowledge is superior to that of any other, is inclined to think as a result of discussion with physicians who have done work in Africa that the disease has prevailed in various African countries.

## EPITHELIOMA IN A BOY OF FOURTEEN.

MILTON B. HARTZELL, M.D.

[Read December 22, 1897.]

In July of this year, A. G——, an anemic youth, sixteen years old, presented himself at the Skin Dispensary of the University Hospital for advice concerning a chronic ulcer of the face, situated over the left zygoma. This ulcer was the size of a dime, irregularly rounded in shape, with an elevated, waxy-looking, rolled-over border, and covered with a thick black crust. According to the statement of the patient the disease had begun two years ago—when he was fourteen years of age—as a small pimple, which persisted for six months before ulcerating. From the first appearance of the ulcer it had never healed, but it had enlarged slowly, and for the most part painlessly, until it reached its present dimensions. Close by its outer edge was a pea-sized tubercle, with a small central opening, of some months' duration; near the left nasal ala was another smaller tubercle, and upon the outer edge of the left nostril was a superficial ulcer as large as a split pea, with a blackish crust, these three small le-

sions having appeared subsequently to the large one over the zygoma. A clinical diagnosis of epithelioma was made, notwithstanding the youth of the patient. To confirm or disprove this a microscopic examination of sections obtained from the border of the ulcer was made, and this fully confirmed the clinical diagnosis, revealing a neoplastic structure consisting of a fibrous stroma in which were numerous irregularly shaped, branching tracts of columnar epithelium, and a round-cell infiltrate separating the neoplasm from the healthy tissues. A forty per cent. plaster of pyrogallol was applied to the largest lesion (more radical treatment not being employed on account of the patient's timidity), and continued for two weeks. After the removal of the slough thus produced the ulcer was dressed with an ointment of boric acid, one dram to the ounce. Under this treatment healing rapidly took place, but it was apparent that there was still some epitheliomatous tissue left after complete cicatrization. The small ul-

cer upon the edge of the nostril was excised, and was found, upon microscopic examination, to present much the same structure as the one upon the cheek.

In twenty-seven cases of rodent ulcer Roger Williams found the average age at which the process began to be 44.4 years in males, 42.1 years in females, while in twenty-two cases of other forms of carcinoma of the skin the average time of beginning was about ten years later, i. e., 55 years. A considerable number of cases, however, occur much earlier; but before twenty epithelioma is an extremely rare disease. Williams has also reported a case of rodent ulcer occurring at fourteen years of age. The patient was a girl, the disease beginning as a small pimple upon the left temple. Curetting, cauterization and excision were without avail, the malady causing the patient's death after twenty-one years. Thin quotes Morris as having seen a case that began at fourteen. Kaposi, in his treatise on *Diseases of the Skin* speaks of having seen several patients between the ages of eight and eighteen, but no details are given. Lossen<sup>2</sup> has reported a case of epithelioma of the forehead occurring in a young girl eighteen years of age, the subject of a pustular acne which produced marked scarring. Over the left brow was an ulcer the size of a two-mark piece, the diagnosis of epithelial carcinoma being confirmed by the microscope.<sup>3</sup> Excision was followed by

complete cure, there being no recurrence after one year. Nobiling has observed an epithelial carcinoma on the scalp of a young man, twenty years of age; and Arnott one upon the left labium of a girl of twenty. Winiwarter has seen a case of carcinoma of the external ear in a young man of nineteen. The earliest period of life at which epithelioma has been observed of which I have been able to find any record, has been reported by Demonceaux, this observer recording a rapidly progressive case of epithelial carcinoma of the skin of the thumb in a child five years of age; the diagnosis was confirmed by the microscope.

In connection with this subject of epithelioma in early life brief reference may here be made to that rare malady first described by Kaposi, and named by him xeroderma pigmentosum, in which ulcerative lesions resembling in their structure and behavior epithelioma, occur in quite early life, associated with pigmentation and atrophy of the skin and the formation of numerous telangiectases. These lesions are, however, but part of a multiform process occurring in some cases with tissue-alterations resembling other malignant growths, such as sarcoma.

In conclusion it may be noted that a very large proportion of the small number of cases of epithelioma occurring in early life belong to that variety known as rodent ulcer. The tendency to early occurrence is shown very conclusively by Williams' statistics, already quoted.

<sup>1</sup> *British Medical Journal*, 1890.

<sup>2</sup> *Ibid.*

<sup>3</sup> *Archiv für Klinische Chirurgie*, Bd. 23.

## OPERATIVE DETAILS IN APPENDICITIS.

JOSEPH PRICE, M.D.

[Read December 22, 1897.]

My discussion is brief, as enough has been said by experienced and reliable authority on this important subject to influence the profession in the right direction; yet the profession has not been influenced to the extent that was hoped. Operations have been refused, delayed and postponed for a variety of unsurgical reasons. Appendicitis is always appendicitis; the diag-

nosis as such is made or not made; the diagnosis is that of appendicitis or of something else. If appendicitis there is but one treatment, i. e., early, prompt removal of the offending organ.

Tinkering of any character, as in all other virulent troubles, is never justifiable; the deaths from delays are numerous and the complications, if death does not

result, are very great and difficult to deal with. Recurrences are dangerous and complicating. The strong argument in favor of prompt primary surgical interference is that the operation is easy and safe in the hands of experienced surgeons or those who have observed and carefully studied all the details of the operation and the mortality is *nil* or very low. General surgeons have been obstructionists on this subject; they have nursed a dread of sepsis or infection. They had the same terror of the peritoneum; their early and long-continued opposition to ovariectomy had its source in like fears.

Incomplete operations have been too common; this fact must be charged to the unreasonable, unfounded fears I have referred to. Surgical completeness is essential to secure the best results. Simple incisions, with imperfect gauze drainage, is one of the mistaken yet common methods—followed usually by fecal fistula, prolonged slough and suppuration. The appendix should be removed in every case, the operation made complete at any cost, as in intra-peritoneal and pelvic operations.

The law as laid down by Mr. Tait, that intra-peritoneal operations should be completed at any cost, applies with as strong or even stronger reasons to appendicitis than to bilateral suppurations of tubes and ovaries. In the pelvic operation the suppuration and adhesions are much more general and extensive. Results can only be perfect in the completed operations.

In appendicitis the suppuration is in the right iliac fossa, high up and easily dealt with; the adhesions are easily freed; visceral lesions easily repaired.

When localized or general peritonitis exists the toilet should be complete and the drainage thorough. The freeing of

omental and intestinal adhesions should be complete in every operation. The avoidance of such adhesions favors infection and complications. Surgeons commonly seek the pus-accumulations behind the cecum, but steer cautiously away from the peritoneal cavity, the pus and filth beneath the omentum and the adhesions of the ileum.

Operative details have been too complicated; transfixion is dirty and infectious; the simple passage of a suture through the dirty canal is unsurgical.

Circular or mass tying and inversion are also unsurgical, incomplete and infectious. A large piece of the appendix remains and the inverted stump creates a septic dead space. The amputation-method, cauterization of the stump or the application of carbolic acid or of solutions is incomplete, dirty and dangerous, dangerous because incomplete and dirty.

We always have considerable liberty about the head of the cecum for suturing. I urge the complete method, extirpation in all cases. The method is very simple and very rapid; it simply consists in cutting out the appendix from the head of the cecum with scissors. The operative steps are as follows: Tie the artery by transfixion of the meso-appendix; encircle the appendix with a knife one-fourth of an inch from the cecum; pass four or six sutures, two or three below and two or three above the appendix; cut out the appendix and tie the sutures. By this simple method all sutures are passed before opening the bowel, and the risk of contamination of sutures and surrounding peritoneum is about *nil*.

I have been performing this operation for some years without any mortality, but with speedy recoveries and a total absence of post-operative complications.

## DISCUSSION.

DR. MORDECAI PRICE expressed the conviction from his experience in appendicitis that all diseased appendices ought to be removed, but in quite a number the organ has already been removed before the operation; that is, the appendix has sloughed off, and the head of the colon is cribriform, or worm-eaten, with not one hole, but many. The patient is so septic that a complete operation would be out of the

question. If under these conditions complete surgery is undertaken, that is, adhesions broken up and an attempt made to close the head of the colon, cutting out the necrosed and diseased part, the mortality would be unquestionably large. It is Dr. Price's practice in these cases to free the head of the colon and the surrounding portions in contact with the abscess-cavity, so as to insure free drainage, and then use



gauze packing. This plan is pursued in the treatment of the desperate cases, with a temperature of 97° or 98°. Dr. Price attaches significance to the record of the thermometer. With a sub-normal temperature he is pretty well convinced that there is pus in the peritoneum, and this relation has been invariably confirmed by his experience.

DR. JOSEPH PRICE said that there are two methods of operating for appendicitis. In the cases in which obstruction has existed for 24 or 48 hours, the patient will be found with a basin on a chair for the persistent vomiting, and with intestinal distention due to acute obstruction. Under these conditions he makes a central incision. The cases might as well not be touched at all as be treated through the common lateral incision. It is a discredit to surgery to operate by the lateral incision. A few, not all, can be saved by the central incision, freeing all adhesions and making a thorough toilet. The simple cases of appendicitis without perforation, or cases of simple localized appendicitis seen a few hours after perforation, can be saved by the lateral method, completed. These are the cases in which the appendix ought to be extirpated. The simple passage of a suture by the common methods of transfixion, that of passing the suture through the infected region, is a dirty procedure, infecting all of the structures through which the sutures pass. It is just operations like this that are causing so many sinuses and repeated operations. The chronic cases, with pus boring up toward the kidney and sometimes through the esophagus or lung, are not very rare. The fecal odor associated with the enormous amount of pus evacuated is sufficient to settle the question of either perforative ulceration of the ascending colon or primary appendicitis. In these old, neglected cases, with multiple sinuses, and rigid adhesions, there is but one thing to do, and that is to evacuate the pus and drain carefully. At present there appears to be an attempt on the part of a few clinicians to persuade the profession that the mortality from appendicitis in children is not large. This is an error, as the mortality is frightful.

DR. JOHN B. DEEVER said that the mortality is quite as high in adults. Often he sees cases diagnosed typhoid fever, gastro-enteritis, etc., in which appendicitis is correctly recognized finally, frequently too late for successful operative treatment.

DR. JAMES TYSON asked with regard to a statement in a medical journal that recovery from first attacks of appendicitis occurs in from 80 to 90 per cent. of cases.

DR. JOHN B. DEEVER said that his experience is not in accord with this statement. In 200 cases of appendicitis operated upon in the German Hospital this year thus far, 153 had previous attacks; this being so, recovery in the proper sense of the word did not follow the primary attacks.

DR. J. PRICE said with regard to the question of recurrence that there is in the Mütter Museum a specimen removed by Agnew from a man during his twenty-fifth attack of appendicitis. Such a case might be reported by twenty-four physicians twenty-four times as a cure, but, of course there was no true recovery until the appendix was removed. The 90 patients referred to in which recovery ensued without operative interference go early to prominent operators.

DR. M. PRICE said that in 67 operations for appendicitis he had lost two; over and above that number, out of the 84 seen before operation 7 were dead before he could reach the house or died before anything could be done. It is a great mistake to say that there is no danger and that there is not a high mortality when the diagnosis has been made. Dr. Price has operated on not less than three or four recurring cases, all having been seen in first attacks, so far as the history indicated; nearly all in the country and nearly all as emergencies. Of the 67 operated on there is scarcely a single one that would have recovered had the knife not been used. Further, some cases in which appendicitis probably exists and pints of pus are discharged from the bowel, with recovery, are reported as cures, but it is bad treatment to allow them to go to this stage.

## EXOSTOSIS OF THE ORBIT.

EDWARD JACKSON, A.M., M.D.

[Read December 22, 1897.]

Orbital exostosis is a condition so rare, and yet so important, that it is worth while to place every case upon record.

M. R., an Italian woman, aged 35, applied at Wills Hospital in November, 1897, in the clinical service of Dr. Conrad Berens, by whose courtesy I saw her and assisted at the operation. She applied on account of a large, rounded tumor at the upper inner portion of the right orbit, which had been growing for several years, but more rapidly of late. The formation had also recently been at times somewhat painful. Her eyes were normal in appearance and function, but the right eye was slightly displaced outward. The tumor was situated above the internal canthus and was extremely hard and not movable.

On November 18th the patient was placed under the influence of ether, and an incision made, commencing at the side of the root of the nose and extending below the brow to the outer third of the orbit. This was carried directly down to the bone, and the soft tissues down to the periosteum were separated and pressed back, chiefly with the handle of the scalpel, until the anterior half of the growth was fairly exposed. The tumor was found to be attached to the inner wall of the orbit by a pedicle considerably smaller than the thickest portion of the growth. Using the supra-orbital ridge as a fulcrum, the exostosis was readily, and with very little violence, broken loose from its attachments. When lifted out of the wound there was found adherent to it a polypus half the size of the end of the little finger; which is still seen, though shrunken by the hardening fluid, in the specimen exhibited. The attachment has been to the inner wall of the orbit, involving the junction of the os planum of the ethmoid and the orbital portion of the lachrymal bone. Its removal freely opened the cells of the ethmoid. A drainage-tube was introduced through the

wound, and carried down into the nose, and out through the right nostril. Hemorrhage was checked by use of hydrogen dioxid. The incision was closed by sutures, a ligature having been placed on the large vein at the inner angle of the orbit. Healing was uneventful. The drainage-tube was removed at the end of a week, and the patient was discharged at the end of two weeks, entirely well. Neither the vision of the right eye nor the relation of the eyes to each other in binocular vision was at any time noticeably interfered with.

The second specimen of exostosis of the orbit, shown this evening, I removed at the Philadelphia Polyclinic in 1891 from a young woman aged 18. It had been growing rather rapidly, having been first noticed two years before. It filled the upper part of the orbit and displaced the eye downward 10 mm. and forward 8 mm. The size of the growth leaving very little room to work between it and the eyeball, its presenting portion was with great difficulty broken up before an attempt was made to separate it from its base. Probably, had I known just what its attachments were, it could have been broken loose and separated as a whole with less difficulty, for the pedicle was not more than twice as large as in the case just reported, though thicker. The removal of the next to the largest fragment, however, enabled me to drill through one side of the base and so weaken it that it was easily broken away. The patient recovered promptly and returned four weeks later to her home in the western part of this State, with the eyeball sunk back to its normal position and good binocular vision, but with slight ptosis still remaining. I understood that subsequently this ptosis disappeared and the patient five years after the operation remained well. This case was reported to the Section on Ophthalmology of the American Medical Association in 1892.

Tumors of this sort are rare. Among 210,000 cases treated at Wills Eye Hospital in the last twenty-five years but 11 cases of orbital exostosis were recognized. They are, however, of especial interest because of their connection with the cavities adjoining the orbit. The first one shown this evening evidently arose from the ethmoidal sinus. The second arose partly from the ethmoidal, and possibly partly from the frontal sinuses. Other cases have been reported in which the growth arose entirely from the frontal sinus. In some cases the origin is said to have been from the wall of the orbit, though in these there might be some doubt as to whether the base of the growth had been reached and completely removed.

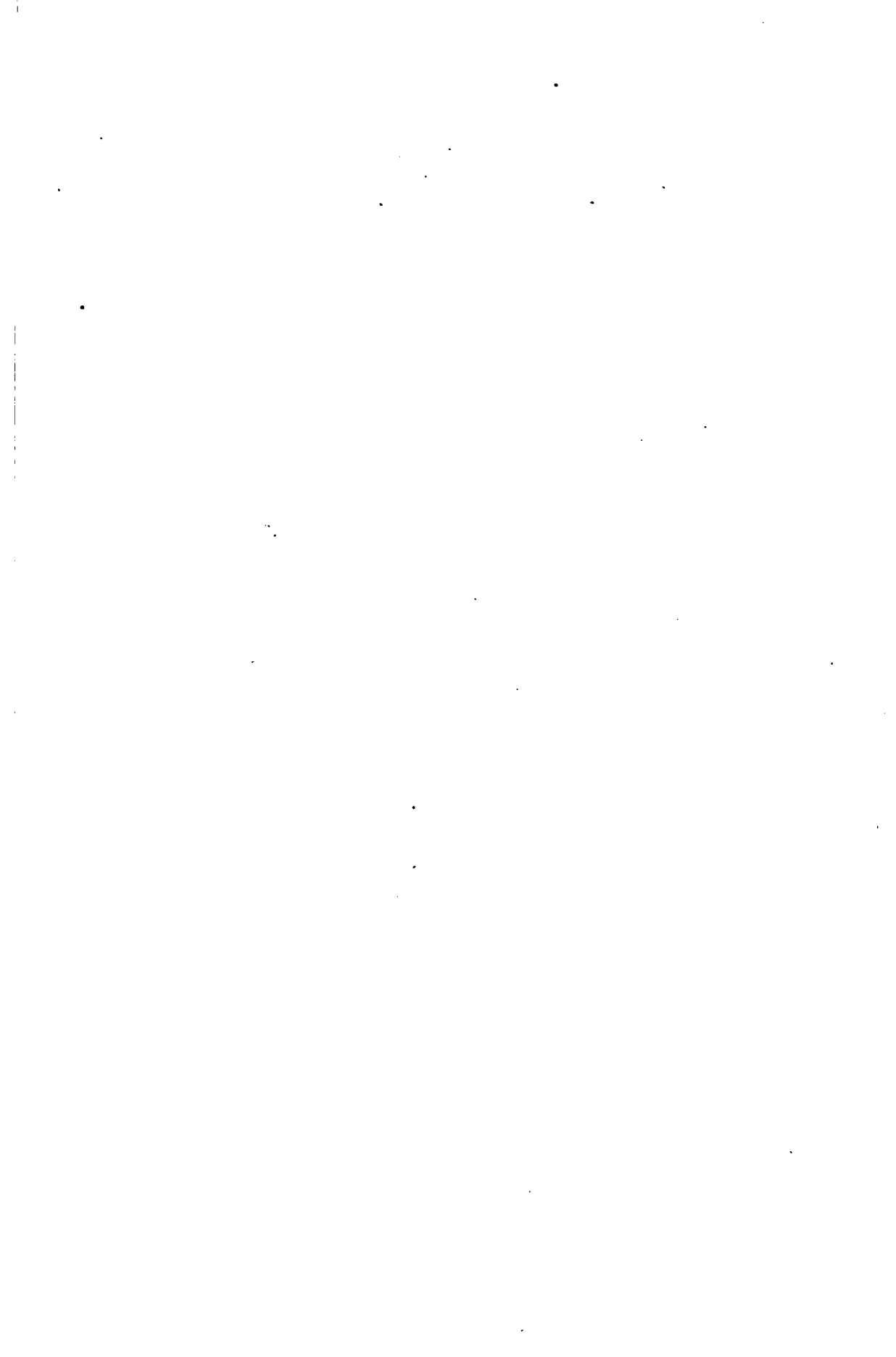
In a case recently reported by Webb and Charmley,<sup>1</sup> a growth the size of a pea, having the physical and histologic characters of an osteoma, the same stony hardness and ordinary structure of one, was removed from the conjunctiva of a young woman aged 20. A number of cases have been reported in which the growth involved the cranial cavity; but in these it was altogether probable that the growth had started in one of the sinuses

and extended inward, with absorption of the cranial wall.

What are known as ethmoidal bubbles, small rounded shells of bone, of which a specimen furnished by Dr. Berens is here shown, and other bony growths within the nose are not very rare; and a growth beginning in the ethmoidal sinus might very well have its origin from one of these, or from some similar structure. The connection of what was evidently an ethmoid polyp with the growth presented this evening is of especial interest.

In regard to the treatment there can be little question but that removal, as soon as the condition is recognized, is the best. It can be recognized early; it has been recognized by feeling before it caused any tumor evident on inspection. The perfectly hard, fixed character of the growth, its slow increase, at first without pain or other disturbance, and subsequently with very slight effects, considering the displacement produced, are quite characteristic. Neglect to remove the formation can only be followed by its continued increase, with the risks of extension in directions where it would be even more harmful than in the orbit.

<sup>1</sup> *Birmingham Medical Review*, January, 1897.



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 Marshall, Clara, 1712 Locust  
 Marshall, Geo. M., 1819 Spruce  
 Martin, Edward, 415 S. 15th  
 Martin, H. B., 1724 Green  
 Martin, Joseph, 2009 Columbia Ave.  
 Masland, H. C., 1614 W. Susquehanna Ave.  
 Massey, G. B., 1636 Walnut  
 Mathews, Franklin, 1720 N. 22d  
 Mays, T. J., 1829 Spruce  
 McAlarney, W. M., 1434 Poplar  
 McAllister, Anna M., 4306 Market  
 McCamy, R. H., 1932 E. Cumberland  
 McClellan, C. C., 316 S. 11th  
 McClellan, Geo., 1352 Spruce  
 McCollin, S. M., 1823 Arch  
 McCreight, Robert M., 1340 E. Montgomery Ave.  
 McDowell, N. S., 1810 N. 16th  
 McDowell, S. B., 925 N. Broad  
 McFarland, Jos., 421 W. Price St., Germantown  
 McKee, Jas. H., 1519 Poplar  
 McKelway, Geo. I., 1612 Locust  
 McLean, Hugh D., 1331 Pine  
 McLean, J. D., 1331 Pine  
 Meeser, Geo. F., 1425 S. Broad  
 Messner, Agnes B. Robinson, 3704 N. Broad  
 Metzler, Gottfried, 949 Franklin  
 Meigs, A. V., 1322 Walnut  
 Miller, D. J. M., 345 S. 18th  
 Miller, G. B., 634 Diamond  
 Miller, J. S., 1917 Girard Ave.  
 Miller, Morris B., 334 S. 15th
- Milliken, F. H., 3614 Walnut  
 Milliken, G. G., 1214 Walnut  
 Mills, Chas. K., 1909 Chestnut  
 Mitchell, John K., 256 S. 15th  
 Mitchell, S. W., 1524 Walnut  
 Mitcheson, Robert S. J., 1522 N. 15th  
 Modell, D. A., 242 Fairmount Ave.  
 Montgomery, E. E., 1703 Walnut  
 Moore, C. C., 2349 E. Cumberland  
 Moore, John D., 1505 N. 19th  
 Moore, H. D., 1528 Tasker  
 Moorhead, W. W., 1523 Pine  
 Morehouse, Geo. R., 2033 Walnut  
 Morris, Caspar, 240 S. 21st  
 Morris, E. J., 128 S. 18th  
 Morris, Henry, 313 S. 16th  
 Morris, J. C., 1514 Spruce  
 Morrison, W. H., Holmesburg  
 Morton, G. D., 2048 Locust  
 Morton, Thos. S. K., 1506 Locust  
 Moss, Wm., Main and Chestnut Ave., Chestnut Hill  
 Moulton, A. R., Pennsylvania Hospital, Department for the Insane  
 Moylan, J. J., 228 Price St., Germantown  
 Moylan, P. F., 1005 N. 6th  
 Muehleck, Geo. A., 1320 S. 5th  
 Muller, A. F., 4753 Greene St., Germantown  
 Munich, A. K., 145 Susquehanna Ave.  
 Musser, J. H., 1927 Chestnut  
 Musson, Emma E., 258 S. 16th  
 Myers, T. D., 1703 Locust
- Nash, Jos. D., 1316 N. 11th  
 Nassau, C. F., 1515 Wallace  
 Neff, Jos. S., 2300 Locust  
 Neilson, Thos. R., 122 S. 17th  
 Neuber, S. T., 1855 Frankford Ave.  
 Newbold, H. A., 3907 Walnut  
 Newcomet, W. S., 3229 Powelton Ave.  
 Nightingale, H. B., 247 N. 6th  
 Noble, C. P., 1509 Locust  
 Noble, Wm. H., 2101 N. 13th  
 Nock, Thos. O., 2507 Brown  
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 Numbers, W. A., 838 N. 24th
- O'Farrell, G. D., 2317 E. Cumberland  
 O'Hara, Michael, 31 S. 16th  
 O'Hara, Michael, Jr., 125 N. 17th  
 Oliver, C. A., 1507 Locust  
 O'Malley, J. M. O., 2217 S. Broad  
 Ott, Lambert, 1531 N. 17th  
 Owen, J. J., 411 Pine
- Packard, F. A., 110 S. 18th  
 Packard, F. R., 324 S. 19th  
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 Paist, Henry C., 536 N. 7th  
 Pancoast, J. Wm., 1611 N. 13th  
 Pardee, H. A., 3410 Baring  
 Parish, Wm. H., 1435 Spruce  
 Parke, Wm. E., 1739 N. 17th  
 Parvin, N. Butler, 1628 Spruce  
 Patterson, F. W., 214 S. 15th  
 Pearce, F. S., 1407 Locust  
 Pearson, John S., 1507 Christian  
 Peck, Elizabeth L., 819 N. 40th



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 Pennock, W. J., 1407 N. 17th  
 Penrose, C. B., 1331 Spruce  
 Perkins, F. M., 1428 Pine  
 Perrine, E. K., 1809 Chestnut  
 Peter, L. C., 2136 Oxford  
 Phillips, J. L., 2213 Tioga  
 Phillips, R. J., 123 S. 39th  
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 Pilkington, Horatio, 4238 Paul St., Frankford  
 Pitfield, R. L., 5450 Main St., Germantown  
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 Posey, Wm. C., 1831 Chestnut  
 Potsdamer, Jos. B., 1333 Franklin  
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 Rhoads, J. N., 1635 S. Broad  
 Rhoads, T. L., 1703 Walnut  
 Richardson, Ida E., 256 S. 16th  
 Riesman, David, 326 S. 16th  
 Ring, G. O., 1442 N. 13th  
 Riskey, Samuel D., 1824 Chestnut  
 Roberts, John B., 1627 Walnut  
 Roberts, Walter, 26 S. 18th  
 Robinson, Wm. D., 2012 Mt. Vernon  
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 Rosenthal, Edwin, 517 Pine  
 Ross, Geo. G., 637 N. 16th  
 Roussel, A. E., 2112 Pine  
 Rugb, J. T., 1431 Walnut  
 Ruoff, Wm., 1301 N. 13th

Sajous, Chas. E., 2043 Walnut  
 Salinger, J. L., 1510 N. 8th  
 Santee, E. J., 532 N. 6th  
 Schafer, Chas., 1309 Arch  
 Schamberg, Jay F., 831 N. Broad  
 Schneideman, T. B., 112 S. 18th  
 Schoales, Chas. B., 1428 N. 11th  
 Schweinitz, Geo. E. de, 1401 Locust  
 Schwenk, P. N. K., 810 N. 7th  
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 Seiss, R. W., 213 S. 17th  
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 Seltzer, Chas. M., N. W. Cor. Spring Garden and 19th  
 Service, Chas. A., City Line and Belmont Ave., Bala  
 Sharp, Leedom, care of White & White, Stephen Girard Building  
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 Shoemaker, Geo. E., 3727 Chestnut  
 Shoemaker, Wm. T., 2031 Chestnut  
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 Spiller, Wm. G., 4409 Pine  
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 Stevens, A. A., 320 S. 16th  
 Stewart, A. H., 252 N. 12th  
 Stewart, D. D., 108 S. 17th  
 Stewart, Wm. S., 1801 Arch  
 Stillé, A., 3900 Spruce  
 Stone, E. R., 1701 Master  
 Stone, Jas. F., 1806 Green  
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 Stout, G. C., 34 S. 18th  
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 Talley, F. W., 1346 Spruce  
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 Tappan, Lucy N., 123 S. 16th  
 Taylor, A. E., 334 S. 16th

- Taylor, Chas. F., 1520 Chestnut  
 Taylor, J. J., 3709 Brown  
 Taylor, J. M., 1504 Pine  
 Taylor, Wm. J., 116 S. 18th  
 Taylor, Wm. L., 1340 N. 12th  
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 Thomson, Wm., 1426 Walnut  
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 Trautman, B., 242 Franklin  
 Tucker, Henry, 19 S. 21st  
 Tull, M. G., 4807 Woodland Ave.  
 Tunis, J. P., care of T. R. Tunis, 502 Walnut  
 Turnbull, Chas. S., 1933 Chestnut  
 Turner, John B., 1525 Christian  
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 Tyson, T. M., 1506 Spruce  
  
 Umstead, Wm. M., 1624 N. 25th  
 Updegrave, Silas, 804 Marshall  
  
 Vanderslice, Ed. S., 127 S. 5th  
 Van Gasken, F. C., 1132 Spruce  
 Van Harlingen, Arthur, 117 S. 18th  
 Vansant, E. L., 1929 Chestnut  
 Veasey, C. A., 116 S. 19th  
  
 Walk, Jas. W., 737 Corinthian Ave.  
 Walker, Gertrude A., 125 S. 16th  
 Walker, Jas. B., 1617 Green  
 Wamsley, Jas. W., 1223 Spruce  
 Ward, E. T., 843 S. 3d  
 Warder, Chas. B., 1305 N. Broad  
 Warder, Wm. H., 1212 N. Broad  
 Watson, A. W., 126 S. 18th  
 Watson, Edw. W., 131 N. 20th  
 Watson, W. N., 4110 Parkside Ave.  
 Webb, Wm. H., 556 N. 16th  
 Weintraub, Sarah L., 1511 S. 9th  
 Welch, Wm. M., 821 N. Broad  
 Wells, J. R., 5138 Lancaster Ave.  
 Wells, P. F., 4023 Brown  
 Wells, Wm. H., 333 Pine  
 Wendell, W. G., 4126 Chester Ave.  
 Werner, Ellis Bruce, 3805 Baring  
 West, John W., 1125 Wallace  
  
 Westcott, T. S., 108 N. 19th  
 Wetherill, H. M., 2208 Locust  
 Wetherill, Henry E., care of Surgeon-General,  
     Washington, D. C.  
 Wharton, H. R., 1725 Spruce  
 Wheeler, E. B., 1918 N. 8th  
 White, J. W., 1810 S. Rittenhouse Square  
 Whiting, A. D., 1523 Spruce  
 Wightman, J. G., 2030 Wallace  
 Wiley, Eugene, 330 Reed  
 Wiley, H. E., 330 Reed  
 Willard, De Forest, 1601 Walnut  
 Williams, C. B., care of J. T. Morgan & Co., Lon-  
     don, England  
 Williams, H. L., 112 S. 18th  
 Williams, Horace, 1717 Pine  
 Willits, C. H., 2115 Chestnut  
 Willits, I. P., 6135 Germantown Ave.  
 Willits, Mary, State Hospital, Norristown, Pa.  
 Wilson, H. A., 1611 Spruce  
 Wilson, J. C., 1437 Walnut  
 Wilson, Richard, San Basilio, Baja No. 5, Santiago,  
     Cuba  
 Wilson, Samuel M., 1517 Arch  
 Wilson, W. R., 112 S. 20th  
 Winter, S. Elizabeth, Conshohocken, Pa.  
 Wirgman, Chas., 2021 Pine  
 Wise, Geo. G., 420 S. Broad  
 Witmer, A. F., 332 S. 15th  
 Wolff, Laurence, 333 S. 12th  
 Wolfe, Samuel, 1701 Diamond  
 Wood, A. C., 1501 Walnut  
 Wood, H. C., 1925 Chestnut  
 Woodbury, Frank, 218 S. 16th  
 Woods, D. F., 1501 Spruce  
 Woods, Mathew, 1307 S. Broad  
 Woods, Walter V., 848 N. 41st  
 Woodward, George, N. 31st, Cor. W. Willow Grove  
     Ave., Chestnut Hill  
 Wray, Wm. S., 26 S. 18th  
  
 Yard, John B., 327 S. 18th  
 Yarrow, Thos. J., 1335 N. Broad  
 Yeager, Frank N., 2826 Oxford  
 Young, Jas. K., 222 S. 16th  
  
 Zentmayer, Wm. J., 1423 Walnut  
 Zeigler, L. S., 1509 Walnut  
 Zeigler, Wm. H., 3028 Frankford Ave.  
 Ziegler, W. M. L., 1418 N. 17th  
 Zimmerman, M. W., 1522 Locust  
 Zuill, Wm. L., 857 N. Broad

## HONORARY MEMBERS.

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Browne, Lennox,	London, England.
Eskridge, J. T.,	Colorado Springs, Colorado.
Kerr, John G.,	Canton, China.
Pavy, Frederick W.,	London, England.
Jackson, Edward,	Denver, Colorado.

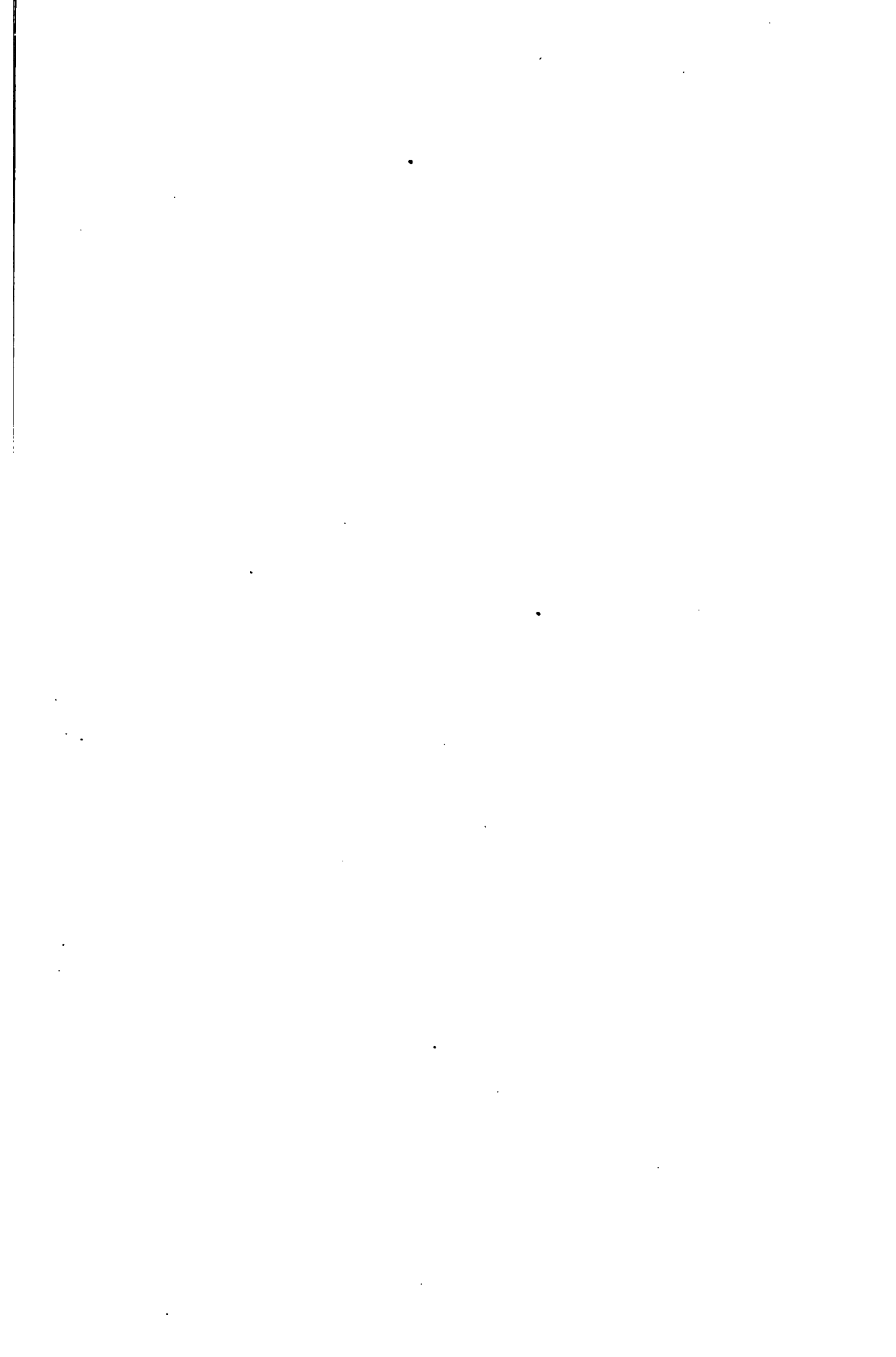
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## DECEASED MEMBERS, 1898.

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Abner F. Chase, M.D.,  
Theophilus Parvin, M.D.,  
William Pepper, M.D.,  
T. H. E. Gruel, M.D.,  
Peter Hooper, M.D.,  
Giovani Trojano, M.D.,  
John Lindsay, M.D.,  
A. H. Audenried, M.D.,  
L. S. Smith, M.D.,  
W. P. Reed, M.D.,  
A. Graham Reed, M.D.,  
W. S. Frick, M.D.,  
A. E. Bate, M.D.

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## CLINICAL ASPECTS OF THE OCCUPATION NEUROSES.

A. FERREE WITMER, M.D.

Read January 12, 1898.

THE disorder variously described as occupation neurosis, professional neurosis, or professional spasm, was first described by Sir Charles Bell in 1830. Since that time the affection has been noted so frequently and in so many different occupations that the old term, writer's cramp, or scrivener's palsy, is no longer applicable. The most recent addition to this group of disorders has been made by Pierce Clark, of the Craig Colony, under the term, ironer's cramp.

Dependent upon the most pronounced symptom, the occupation neuroses have been arbitrarily divided into the spastic, the neuralgic, the tremulous, and the paralytic forms. Of these, the paralytic form is the most common according to Wood, and the spastic according to Dana.

If we adopt as final the recent investigation of the mechanism of tremor, we must conclude that tremor is only a higher grade of spasm, and both, in spite of the pathologic increase of muscular tonus in spasm, are alike paralytic phenomena.

We would have, therefore, but two distinct forms of the affection, the paralytic and the neuralgic. These two forms are frequently combined; the painful sensations in occupation neurosis differ from neuralgia in being excited at first only by special action of the overtaxed muscles.

As Gowers points out, it must not be forgotten that the spasm in the muscles may be merely a local indication of a general nerve-exhaustion.

The act of writing, as is well known, is most highly specialized, and requires many years of patient effort for its proper adjustment.

Buck, in a paper read before the Section on Psychology, at the recent meeting in Montreal, called attention to the fact that

those faculties that are developed latest, soonest decay.

It is to be expected that the most highly specialized of all our faculties—the co-ordinate movement of the finer muscles of the hand—should first become disordinated as a result of general irritation.

McConnell, in the *Philadelphia Polyclinic* for 1897, reports a case that favors this view.

The patient, a brick sorter by occupation, had four attacks of finger palsy within short intervals. The third attack was apparently induced by intestinal dyspepsia. Several cases that have come under the writer's observation also illustrate a possible primary affection general in character.

CASE I.—Female, age 50; bookkeeper by occupation, complained of weakness and pain in index finger and thumb of right hand when attempting to write. The onset was sudden, duration about two weeks. Examination led to a diagnosis of urate poisoning. The patient improved under suitable treatment without discontinuing her work.

CASE II.—Male, age 60, a tailor by occupation; in good health until one year ago, when he noticed an increasing stiffness and soreness in index finger and thumb of right hand. This man had been actively at work from the age of sixteen until a few months before the onset of this trouble, when he lost his position through some indiscretion.

CASE III.—Female, age 55, housewife by occupation, in apparent good health, complained of sudden dropping of ring finger of right hand at frequent intervals throughout the day. This was first noticed after a long period of attendance upon a sick sister.

In all of these cases it will be noted that the disorder occurred at a time of life much

later than that in which the so-called occupation neuroses usually do.

An inherited tendency to nervous affections can often be traced in subjects of occupation neurosis. In the case of Clark's, before mentioned, the patient was an epileptic; in a case formerly under the writer's care the patient was a high grade imbecile. Vance, quoted by Gowers, cited the case of a patient who, to rest his hand, went on a visit to a distant brother and was surprised to find that he too had given up writing for the same cause. Gowers also mentions a characteristic case in a lady whose father suffered from writer's cramp.

It is not improbable that lack of development of the nerve centers or their early breakdown is a more potent factor in predisposing to an occupation neurosis than is commonly supposed.

Wright, in the *New York Medical Journal* for 1897, calls attention to a condition which includes spasm or cramp of the muscular fibers of the iris, ciliary muscles and extrinsic muscles of the eyes. He regards this as analogous to writer's cramp and proposes the term reader's cramp for the affection. Many of us have personally experienced a twitching of the upper eyelid, usually the right, following upon mental work of more than usual severity. Such tremor could hardly be called a symptom of an occupation neurosis. Is it not more likely that this and other forms of more marked spasm are due to nerve-tire, and should therefore more properly be classed under the somewhat overburdened term neurasthenia?

The symptoms of the occupation neuroses are two well known to need elaboration. It will be necessary, however, to consider these briefly in order to comprehend the pathology suggested by them.

Both motor and sensory changes are found; the onset is usually gradual. With the development of spasm there is an increasing tendency to grasp the pen more tightly. This but increases the difficulty in writing, and the patient finds that he writes slowly and with effort as if the hand were weighted. The hand soon tires, and the aching pain referred to the part involved becomes unbearable. The power in the hand is gradually diminished, but no true wasting occurs.

The electric irritability of the nerve and muscle is usually normal, but not infrequently a light quantitative increase is found. The

sensory symptoms consist of a sense of fatigue, which later may develop into active pain often lancinating in character. The pain occurs at the first only during the act which has been in excess, and is referred to the part involved, but later may pass to distant parts, as the axilla in writer's cramp, and the occiput in reader's cramp.

Nodular swellings distributed in the course of an involved muscle, as noted by one observer, I have never seen. Painful mass-swellings, probably induced by an exudation of lymph, are exceedingly common.

As no anatomic changes have thus far been found in the occupation neuroses, the pathology can only be surmised. Four theories are held regarding the nature of these disorders.

The first is advocated by Poore, who claims that the disease is local, and that a weakness in some muscles permits of the overaction of their antagonists, which increases the spasm.

A second theory is offered by Moyer, who, in a recent paper on "Simple Myositis as an Occupation Disorder," concludes that the overworked muscles, or, at least, the peripheral endings of the nerves in the ultimate muscular fibers, are mainly involved. In support of this theory he offers the following observations made in two cases:

1. Electrical examination is normal.
2. Muscle involvement is identical with the overtaxed muscles.
3. Disinclination to work is due to pain.
4. Exacerbation of the condition occurs when forced work is attempted
5. No association of rheumatic or other taint has been found.
6. Sensation in the involved part is perfect.

A third theory is suggested by Romberg, who considers the spasm a reflex act due to stimulation of the sensory nerves in the act of writing.

The fourth and most commonly accepted theory is that the affection is primarily and essentially central. In advocating this theory Gowers writes "that there is at present no direct evidence as to the part of the nervous system in which the primary derangement occurs. That the action of the motor and sensory nerve-cells of the spinal cord must be disordered is certain, since it is through them that spasm is pro-



duced and pain perceived. But we do not know whether their derangement is primary, or whether it is simply the effect of a primary disorder in those cerebral centers in which the movements are arranged. The latter is the more probable, and the central region of the cortex is that to which we should naturally turn as the seat of the primary derangement, since it is from this part of the brain the spinal cells are directly excited."

Let us see how this view is borne out experimentally. At a previous meeting of this society I had occasion to refer to the masterly work of Hodge, on the changes in nerve-cell activities. As these experiments have a direct bearing upon the pathology of occupation neurosis I may be pardoned for giving them somewhat in detail.

The first of the papers by Hodge was published in the *American Journal of Psychology* for 1889. Since then an important paper entitled "A Microscopical Study of Changes Due to Functional Activity in Nerve Cells" has been published in the *Journal of Morphology* for 1892 and 1894. The investigator was led to make these experiments after observing the well known changes that occur in the nuclei of cells when the nerve going to a gland is stimulated. Reasoning from these changes Hodge inferred that if the nerve-cells have any function it might be possible to demonstrate similar changes in them.

A nerve-cell, it will be remembered, is in general composed of a mass of granular cytoplasm, enclosing a large nucleus, which exhibits a delicate reticulum and contains a prominent nucleolus. In a spinal ganglion cell these elements are best marked. Morphologically, therefore, the ganglion cell does not differ from a gland cell, so that it would be quite reasonable to expect changes in the nerve-cell similar to those that occur in the gland cell under like conditions.

In the experiments by Hodge, frogs, cats, dogs, pigeons, English sparrows, swallows, and honey bees were freely used. The first series of experiments consisted of studies in the effect of electrical stimulation of the ganglion cell. The scheme of procedure was to stimulate a nerve going to a ganglion on one side of the animal, leaving the corresponding ganglion of the other side for control. The stimulated nerve was never divided, so that the contractions of the mus-

cles could be used to indicate the healthy condition of the nerve. As Hodge states, if a nerve is conducting impulses peripherally to its muscles it may be taken for granted that it is conducting impulses in like manner centrally to its ganglion.

The selected ganglion cells were stimulated for seven hours and comparison made with the resting nerve. The examination showed, *A*, for the nucleus (1) marked decrease in size, (2) change from a smooth to a jagged, irregular outline, (3) loss of open reticular appearance with darker stain; *B*, for the cell cytoplasm (1) slight shrinkage in size, (2) lessened power to stain or to reduce osmic acid, (3) vacuolations. Similar anatomic changes were found as the result of daily fatigue.

As Hodge points out, simple atrophy of the nerve-cell with shrinkage and vacuolation are considered pathologic conditions by Obersteiner. While Gowers admits that the significance of the vacuoles in nerve-cells has been much discussed, he is inclined to regard them as forming during the process of hardening, but only when the cells are in an abnormal state.

If we adopt these findings of Hodge as the pathologic basis in the occupation neuroses, our prognosis must always be guarded, and frequently unfavorable, particularly so if the disease has lasted for some time, when perfect rest cannot be secured and no cause other than excessive use of certain muscles can be traced.

Following the suggestion of Dana in the treatment of *tic douloureux*, the most useful method of treatment in occupation neuroses of aggravated type I have found to be the injection of strychnin sulfate deeply into the muscle in doses of  $\frac{1}{4}$  grain, repeated three times weekly. Not only is the function of the muscle favorably influenced, but the pain also is markedly alleviated. Complete rest or change of occupation are useful adjuvants in the treatment, and not infrequently will effect a cure alone. Where the occupation must be carried on, the use of the other arm may be advised. It is not uncommon to find that many years may elapse before the sound arm begins to be affected. In one case, recently brought to my notice, where a bank-clerk at the age of 35 developed cramp in the right hand, he learned to use the left hand, and had no return of the trouble up to the time of his death, forty years later.

Galvanic electricity, light massage and finger exercises have their advocates, and at times prove beneficial. Nervine and hematic tonics are often indicated and should be given freely.

As a prophylactic measure, the vertical system of handwriting, recently introduced into the Philadelphia public schools, promises well.

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#### DISCUSSION.

DR. F. SAVARY PEARCE said that the points brought out so admirably by Dr. Witmer are mainly correct. In most occupation neuroses the basis (*i.e.*, the essential element) is neurasthenia, and the overworked part simply brings out the manifestation in the end-organ by the local paresis, which is demonstrated by a passive or a spasmodic condition being present in the case. Some cases, however, are manifestly only of a muscular type, in which there is no neurasthenic condition. The case was recalled of a man in Dr. Morris J. Lewis's clinic at the Orthopedic Hospital, a burly motorman, in no way neurasthenic, whose constant application of the brake had caused this type of the disorder. There was spasm of the flexor muscles of the right forearm. The patient acquired a local occupation neurosis in which the muscles alone were involved. The man's prompt recovery took place under rest, massage, and galvanism, and he is back at work.

In some cases, such as those of telegraph operators, besides the neurasthenia, there is often aggravation from the position in which the arm is held; so that what is really incipient neuritis due to pressure of the forearm, on the table worked at, is developed. Dr. Pearce had seen one private case in which the patient, an intelligent man, claimed to have gotten marked relief by the use of a well-made pad, fitting about the forearm and elbow. This man stated that many others obtained relief in the same fashion.

Undoubtedly local or constitutional rest, together with a change of scene in properly selected cases, forms the broadest basis for cure.

DR. A. A. ESHNER said that the statements made regarding the etiology of the occupation neurosis illustrates the fact that disease in general is usually not of simple or single etiology. In the development of all conditions of disease there is not only the final excitant, but there must also be at the same time a receptive condition of the body. The mere presence of bacteria in the organism does not constitute the disease, but it is the reaction between these and the bodily organism which results in the development of those processes to which collectively we give the name diseases. The same fundamental principle applies to the group to which the occupation neuroses belong. The receptive or predisposing condition may be due to a variety of causes, such as indigestion, intoxication from within or without, overwork, etc., and if in neurasthenia it is intended to include all of the fatigue-neuroses, then the occupation diseases may be considered a form of nerve weakness. These occupation neuroses develop usually in persons who are overworked and under-rested. For instance, in the case of a car-driver, it is perfectly well known that his hours are exceedingly long. His work, while not really arduous, calls forth certain manipulations, such as the use of the brake and the ringing of a gong with the foot, which badly or persistently executed will under certain added conditions give rise to neurosis. The point to be insisted upon is that there must be in the first place a predisposition to the affection, because, while many are exposed to the risk of the disease, this develops in only a few. It is not a class-disease, as it occurs not only in penmen, but also in typewriters, piano-

players, telegraphers, in motormen, in ironers, and many others.

Moyer<sup>1</sup> has reported the case of a shoe-salesman who developed a peculiar occupation neurosis as the result of stooping constantly in his work. The diseases of this group must, therefore, be looked upon as fatigue-neuroses essentially of central origin. When peripheral manifestations are present, such as pain or swelling, from perhaps neuritis or myositis, these may be considered as accessory or secondary. In accordance with the severity of the lesion there result either spasm or paralysis essentially. The spasm must be looked upon as of the nature of an irritable weakness of a degree not sufficient to cause paralysis.

While the diseases under consideration usually begin as specific disorders, they may become more general; that is, the typewriter

or the penman, for instance, is at first unable to pursue the occupation that finally brought on the disease, although he can for a time perform other movements with the affected part; but in aggravated cases the power of performing other movements is lost also. This fact tends to support the notion of the central origin of the disease, in addition to the fact that when the disease has developed in one member and a second member is utilized to perform the same function, the latter not rarely suffers like the first. The best treatment is that into which rest essentially enters. There are various accessories, galvanism, and massage especially, but the use of apparatus is probably not of large importance. In prophylaxis much depends upon maintenance of the general health, avoidance of fatigue and the proper adjustment of the part or parts employed with regard to the work in hand.

<sup>1</sup> *Medical News*, February 15, 1893, p. 188.

LIBERATION OF THE RING-FINGER IN MUSICIANS BY DIVIDING  
THE ACCESSORY TENDONS OF THE EXTENSOR COM-  
MUNIS DIGITORUM MUSCLE.

WILLIAM S. FORBES, M.D.

Read January 12, 1898.

AT a meeting of this body, held November 12, 1884,<sup>1</sup> I read a paper on "Dividing the Accessory Tendons in the Hands of Musicians." At that time I said that I devised and practised this operation in 1857. I now wish to repeat this statement, with other parts of that paper, and make certain addenda which further experience and observation in 466 cases make proper and manifest.

When the middle finger and little finger of the hand are brought down by the flexor muscles, and their balls are held down firmly against the keys of a musical instrument, as in performing on a piano for the purpose of producing continuous sounds, and when at the same time it is necessary to extend and then to flex the ring-finger in order to produce accompanying sounds, it will be found that in the still flexed position of the middle and little fingers, the *ring-finger* can be but very slightly extended. Its complete extension, without operative interference, can only be brought about by long-continued exertion in practice when elongation of certain accessory, but restricting, tendons is made by nutritive growth. To explain the cause of the inability to extend this ring-finger at once and completely, and to demonstrate the way to remove this cause by a surgical operation of simple moment, is the object of this paper.

In the dorsal aspect of the metacarpal zone in man's hand, dissection shows that the tendon of the extensor communis digitorum muscle that goes to the ring finger gives off a slip on either side, one of which goes to join

the extensor tendon of the middle finger and the other to join the extensor tendon of the little finger. These two slips are known as the *accessory* tendons, or lateral "*vincula*." If the middle and little fingers are held in a flexed position it is manifest that these accessory tendons, by virtue of their attached extremities, will hold in check the extending power of the muscular fibers operating upon the tendon of the ring-finger, and thus this finger is restricted in its function of extension to a very limited degree. These accessory tendons are sometimes found in one hand and not in the other. They exist more frequently in the right hand than in the left. The question may be asked, of what use are these accessory tendons in man? They seem to be of no use, but rather appear to be the feeble analogues or vestigial remains of what are perfect organs in some of the lower animals, just as the plantares muscles and the ligamentum nuchæ in man appear to be the vestigial remains of what are well-developed and important organs in the quadruped. While one may not know the reason of these vestigial remains in man, one may be permitted to believe that their presence in his body may be disclosed by comparative anatomy. They are constantly found in vertebrate animals. This is a striking instance of the unity of design. This brings us to look into the comparative anatomy of the accessory tendons and to examine the anatomy of the entire hand, muscular and ligamentous. In all felines we find that although lateral motion in the hand is restricted, yet flexion and extension are very

<sup>1</sup> See Transactions of the Philadelphia County Medical Society, 1884-5, vol. vii.

forcibly made. Thus in the cat we find not only a common extensor muscle, but also a proper extensor for the index, middle, ring and little fingers. The proper extensors for the index and the little fingers have their analogues in man in the extensor indicis and the extensor minimi digiti. In man the tendon of the common extensor of the ring-finger gives off the lateral or accessory tendons, which go to unite with the neighboring tendons, namely, to the extensor tendon of the middle finger and to the extensor tendon of the little finger. In the cat this is not the case, for here we find, instead of these accessory tendons, two perfectly developed organs, muscles with their special tendons. Hence we may believe that the accessory tendons in man appear to be the feeble analogues or the vestigial remains of two proper extending muscles in the cat.

In examining the muscular anatomy of the hand in man, it will be found that flexion and extension are produced not only by those muscles which especially make these motions, but by all those muscles whose tendons pass beyond the radiocarpal articulation. Flexion of the wrist is produced by the radial and ulnar flexors of the carpus, and is aided by the flexors of the fingers. Extension of the wrist is accomplished not only by the three muscles specially devoted to that function, the extensor carpi radialis longior and brevior, and the extensor ulnaris, but also by the extensors of the fingers. To ensure the efficient action of the long extensor and flexor muscles of the fingers, it is necessary that there should be simultaneous action of the flexors and extensors respectively of the wrist; for the wrist-joint must be made firm by its radiocarpal extensors, and by its radiocarpal flexors in an extended or partially extended, or in a flexed or partially flexed position, or when the hand is in motion, as may be desired, in order that the long flexors of the fingers or their long extensors may act. The flexor communis digitorum sublimis and the flexor profundus muscles flex respectively the second and third phalanges of the fingers, while the extensor communis extends the first row of phalanges.

The four lumbricales muscles arise from the deep flexor tendons in the palm of the hand and, passing to the radial side of the fingers, their tendons may be traced to their insertion, chiefly with the tendons of certain

interosseous muscles, into the dorsal aspect of the base of the second and third phalanges, while certain filaments also go to the lateral aspect of the common extensor tendons on the dorsal aspect of the first phalanx. The function of the lumbricales is to extend the second and third phalanges and, it may be at the same time, flex the first phalanges.

The seven interossei muscles arise from the metacarpal bones on their proximal and palmar surfaces and are inserted, certain of them, partly into the lateral aspect of the base of the first or metacarpal phalanx of the finger and partly into the neighboring expansion of the common extensor tendon near the attachment of the neighboring lumbricalis tendon; others of the interossei have their entire insertion into the lateral dorsal aspect of the base of the second and third phalanges.

In consequence of these insertions of the four lumbricales and the seven interossei muscles, they have a double action. This double action consists in the flexion of the fingers at their metacarpo-phalangeal articulation and in extension of the second and third phalanges.

The lumbricales and interossei muscles, therefore, are antagonists to both the long flexors and the long extensors. This partial and combined action of the long and short muscles upon the fingers has been known for some time, especially as regards the lumbricales; but it has now been confirmed and elucidated as regards the interossei, by the electro-physiologic observations of Duchene. (*Physiologie des Mouvements.*)

With respect to the interossei, it is further to be observed, that besides being *flexors* of the first row of phalanges and at the same time *extensors* of the second and third phalanges, as already stated, they also severally exercise an abducting or adducting action, as occasion may require, on certain fingers, or direct them away from or towards the middle line of the hand according to their places of insertion; thus the four dorsal interossei are also abductors of the index, middle, and ring fingers; and the three palmar interossei are also adductors of the index, ring, and little fingers, respectively.

I take it for granted that the perception of pleasure in the equality of sounds is one of the principles of music. The power, of producing the equality of sounds, with ease and comfort to the performer, depends upon the

unrestricted freedom of movement of each and every individual finger employed in the act. Now the accessory tendons of the extensor of the ring-finger restrict, to a marked degree, the power of extending the ring-finger. Robert Schumann was so anxious to overcome this restriction on the part of his ring-finger tendon that in an evil moment he invented a machine for holding up this finger while with the others he played exercises. In this way he so strained his finger that in a short time it became practically useless and his career as a *virtuoso* was gone forever. Afterwards his genius translated him to the noble company of great composers (Hadow: *Studies in Modern Music*). When these restricting or accessory tendons are divided, then the ring finger has perfect freedom of motion and can at once be extended with the greatest ease and to an equal degree with its neighbors. The feeling of restriction, which one has to contend with whenever one sits down at the piano, is entirely removed by the operation, and the lesson on the piano is anticipated with a degree of pleasure hitherto unknown. I have been told repeatedly by a great number of students in music, both men and women, that they had taken, under their masters, a far greater number of lessons on the piano because of their more rapid advancement consequent upon the ease and comfort with which they could execute the movements of the ring-finger after the operation, the restricting tendons having been divided.

The operation of dividing these restricting tendons requires no particular preparation of the patient. It is easily and quickly performed, is almost bloodless, and, under a little cocaine locally applied, is quite free from pain. The operation should always be performed with antiseptic precautions. With a small bistoury, a little puncture wound is made and the restricting tendon is found, immediately beneath the skin, lodged in connective-tissue and external to the investing sheath of the hand which encases its bones, its ligaments and interossei muscles. The little bistoury, with its cutting edge turned upwards, is carried in beneath the restricting tendon and external to the sheath encasing the framework of the hand; the tendon is then readily divided, and the bistoury is withdrawn. A little flexible collodion is then placed over the wound. This soon drops off, and in a few days there is scarcely a vestige to be seen of what has been done.

There is no interruption, whatsoever, in the practice on the piano. The hand is not impaired in its strength or force of movement, or in any of its endowments in the slightest degree by the operation. On the contrary, the freedom of movement of the ring, middle, and little fingers is much increased. The knuckle-joints are to one side of the little punctured wound that is made, and are out of harm's way. The strong transverse, or intermetacarpal ligaments binding the digital extremities of the knuckle or metacarpal bones together are on the palmar surface of the hand, and the great nerve-trunks of motion and of the sense of touch are also on the palm of the hand, and are far out of the way of being injured. There are only the very small dorsal digital filaments of the posterior branch of the ulnar nerve going to the skin on the back of the little and ring fingers that are even liable to be touched in the operation. The punctured wound healing by first intention, there is no scar and but the faintest line visible.

These restricting tendons may be divided while the hand and fingers are extended by an incision made down to and through each individual tendon. I knew one man who had operated on himself successfully with a razor. He divided the two tendons on his left hand by making, of course, two separate incisions with the razor. The tendon may also be divided by an incision made directly down to it, and then lifting the tendon from its position with an aneurism needle, it may be divided with a pair of scissors.

The method I have devised and now practise is to have the patient strongly flex his fingers, as in making a fist; by this action, it is manifest that the two accessory tendons are brought down to the very angle made by the first row of phalanges with the metacarpal bones and are thus made tense. This movement of the tendons towards the knuckle can be felt by the surgeon, and it can often be seen.

I have now divided these restricting tendons 466 times. Among the patients are some of the most distinguished pianists in the country. Other surgeons have very frequently divided them. I am credibly informed that the operation has, up to this time, been performed over 2,500 times.

I have never had a single accident ensuing from this operation, nor have I ever heard of one happening to others.

## DISCUSSION.

PROF. RICHARD ZECKWER said that in 1879 a series of articles on the anatomy of the arm and hand, by Gustave Stoewe, director of a conservatory in Potsdam, appeared in the "*Klavierlehrer*." These papers recommended a preparation made by Prof. Wickersheimer, of the Anatomic Museum of Berlin, by which the muscles of the dead human body moved as in life. He obtained from Prof. Wickersheimer an entire arm. Having studied anatomy at the University of Leipzig, he believed that through this knowledge he could probably obviate the difficulties that music-teachers find in educating the fourth finger. As all know, there is greater difficulty in lifting that finger than any other, and it takes many years of arduous study to overcome this obstacle in piano-playing. Studying the anatomy of the dissected arm, he was convinced that the two accessory tendons were probably at fault. Physicians who came to see the Wickersheimer preparation differed—some stating it was the extensor muscles, some the lumbricales. Dr. Forbes alone agreed that the accessory tendons were the cause of the trouble and promised, if a willing subject were found, to operate on those tendons and watch the result. The speaker's colored servant expressed himself as very willing, as he was musically inclined and had great difficulty with his fourth finger. Dr. Forbes very kindly performed the operation at Prof. Zeckwer's school, and in his presence and with great success. Before the operation, he measured the height to which this colored man could raise his finger—it was a quarter of an inch. After the operation, he lifted his finger one inch and a half. At that time he was under the impression that this was the first time the operation was performed, but he afterwards heard from Dr. Forbes that he had performed the operation in 1857. Since then he had written several articles on this subject for both American and German papers. Through these articles Bonelli, of San Francisco, became so interested in this operation that he gave up music-teaching and studied medicine in order to perform it. He was said to have been one of the best teachers in his city. The speaker had the pleasure of meeting him several years ago in Detroit, at

the meeting of the Music-Teachers' National Association, and witnessed six operations performed by him. He had then performed over 1,500 operations, many on celebrated musicians. As a musician, Prof. Zeckwer believes this to be a very useful operation, knowing it saves much time and labor to a music student, in fact, giving a freedom of the finger in 15 minutes, that could hardly be acquired through technical studies in 20 years.

DR. WILLARD said that he well remembered Dr. Forbes' original paper upon this subject. The results, after 12 years of earnest and effective work in this direction, are before the Society. Dr. Forbes' early advocacy of the operation induced Dr. Willard and others to follow his example. The speaker had found the method to possess the qualifications of safety, simplicity, and efficiency. No unpleasant result had occurred in his experience.

In a few minutes this operation accomplishes what a musician can only obtain by years and years of work. By increased nutrition only, can elongation of a tendon be produced; it cannot stretch, but it can be increased by growth; this, however, is a long, tedious process, which the majority of musicians are glad to shorten through so simple an operation, which is painless and has no evil consequences. As regards hemorrhage, if one uses a little care to avoid superficial veins, there need be no bleeding. Dr. Willard asked Dr. Forbes in what percentage of subjects this accessory exists.

DR. HOLMES would have been delighted, had he had the opportunity to see the paper that was read by Dr. Forbes, a number of years ago, on this subject. He had been much interested in this operation, and had investigated its effects, by inquiring of a number of people who have had the operation performed upon them. Before discussing that, however, he took the liberty of disagreeing with Dr. Forbes as to the accessory tendons being "*analogous*" to certain muscles in the cat and being useless in man, even though he ran the risk of bringing down the wrath of the evolutionists upon his head. The distinguishing feature of the human hand is the

completeness of its grasp by the co-aptation of the thumb to the palm. The accessory tendons, by aiding in the co-ordination of the fingers, strengthen this grasp, and their division must weaken it. In fact, he had met with one case, in which the vincula were cut, and, although the patient could spread the fingers further, there was, according to her statements, a distinct weakening of the hand, and she thought she could strike with the ring-finger with less force than before.

It is unfortunate that, not being a musician, he has had to go to musicians and ask their opinion as to the results in their experience. Their opinion is not as universally favorable as the remarks of the preceding speakers would seem to indicate. Mr. Zeckwer himself had answered that all musicians did not approve of it, "but it was due to prejudice." It seems as if, from an anatomic point of view, there might be some sources of interference with the free movements of the ring-finger, besides these vincula accessoria. The simplest movement is the result of a complex mechanism, to which the flexors and extensors, the lumbricales, the interossei, the nerve-supply and the nerve-control, all contribute, so that the variation in any one of these, or all together, might exert an influence in retarding or accelerating such movements. In one or two cases, Dr. Holmes found people who were very fine musicians, who took it for granted that they had become so because they had had this operation performed. We can see that, in such cases, the operation, perhaps, has been given a little more credit than it had actually deserved. If we find, by keeping careful records, that in every case, as he understood Dr. Forbes to assert, in his experience, the patient has been improved, this would be a stronger argument than any theoretic objection could possibly be. Without desiring, in any way, to take away from Prof. Forbes any credit for devising and establishing this simple but at the same time effective operation; yet, in view of the fact that there are some cases not benefited; that the hand must be, though ever so slightly, weakened by their section, and that some musicians object to its use, or declare it of no avail; it would seem as if there might be some selection of cases even in so simple an operation, and that we should regard each case as experimental, and should be careful not to absolutely promise every patient a

greatly increased power of movement merely by dividing the vincula accessoria.

DR. G. G. DAVIS said that if the movements of the finger were controlled solely by this accessory tendon, then the loosening of it would probably increase the movements very much. The binding of this accessory part, as shown in the dissected hand, differs from what is shown in the illustration. In the illustration, it is shown as a very distinct cord; in the hand, it is shown as a more or less broad band, therefore the division of such a large amount of tissue may, possibly, tend to produce weakness; the presence of such an amount of tissue tends to act as a posterior ligament analogous to the anterior portion of the hand. It also shows, that in division, the exudate that is liable to pour out might cause a reuniting of the tendons. If the accessory tendons were always so distinct as they are shown on the diagram, then their division and the continuous movement of the fingers afterwards—as he understands the patients are allowed to play immediately after the completion of the operation—would prevent reunion; but if tenotomy is done in a hand similar to the one dissected, union will probably occur in spite of thorough division. He thinks the testimony of the musicians themselves is the thing to decide this question. The operation from a surgical standpoint has been worked up so ably by Dr. Forbes that it practically needs no addition, but it is results that one wants to know, and he certainly would lay great stress on it when a musician of the eminence of Prof. Zeckwer is willing to advocate it, because his influence upon pupils is certainly of great importance to him, and the stand he takes upon the subject has been carefully considered, and is therefore to be valued.

Dr. Davis's opportunities for observation have been limited. He has one friend, in whom the ease of performing has apparently increased very much, so that tiring does not so readily occur. Another had it done on one hand and not on the other, and he did not see much difference. On examining the hand on which the operation had been done, one could detect quite readily a marked tendon there, as if it had grown together. If the hand was one, in which the bond of union had been a broad tendinous band, and had reunited, one could readily see why he should not have experienced much benefit from the operation.



He believes that the movements of the hand do not occur simply from the extensor and flexer tendons. The lumbricales and interossei have much to do with it, and even one who is deprived to a certain extent of the very best use of the extensor tendon might possess an exceedingly good use of that finger by extreme development of the lumbricales and interossei muscles. A person who has developed his hand from an early stage until he has become an excellent performer, has possibly stretched this tendon to a considerable extent; and, therefore, he should expect in the expert player that the

benefit derived from it would be much less than in a person, young in life, in whom the lumbricales and interossei have, as yet, not developed. Prof. Zeckwer, in discussion, stated that in one of the cases he had seen, an addition of an inch in elevation of the finger had been obtained. Still the testimony goes both ways. He was told that 20 years ago Carl Wolffsohn returned from abroad with this operation very much in his mind, and persuaded a colored man to have his tendons cut, and the result then was not so marked as to induce Wolffsohn himself to have the operation performed.

## THE STERILIZATION OF URETHRAL INSTRUMENTS WITH PARAFORM.

EDWARD MARTIN, M.D.

Read January 12, 1898.

THE original purpose of the experiments which will later be detailed by Dr. Patterson, and which were performed by him, was to discover a certain, comparatively rapid and practicable method of disinfecting soft urethral instruments without in any way injuring them. Further, to determine how an instrument rendered sterile can be introduced through the urethra into the bladder without becoming infected and carrying this infection with it, and to devise a simple technic by means of which not only can the physician or surgeon practise sterile catheterization, but the intelligent patient can also perform this operation in a perfectly cleanly manner.

While it is true that the soft rubber catheters can be boiled without injury and can thus be rendered perfectly sterile, the majority of woven instruments are more or less harmfully affected by this procedure. In some, which are most carefully made, repeated boilings may be practised without deterioration, but this only holds true of a few makes. Moreover, the boiling is in itself time-consuming and sometimes cannot be accomplished, hence it seemed worth while to investigate from a bacteriologic standpoint the value of some of the more promising methods of sterilizing catheters by means of chemical agents.

A most convenient and generally applicable method seemed to be offered in the use of antiseptic soaps. Of these we made trial of the preparations which have been received with the most favor by the profession, which have been put forth by houses of best repute. The strong sublimate soaps proved utterly inefficacious, and this holds true of the other antiseptic soaps. Indeed no material difference was noted in the richness of cultures from instruments which had been washed in

antiseptic soap and those which had been washed with the ordinary cleansing soaps.

Alcohol, which has been repeatedly advocated in medical literature as serviceable for the removal of grease, and as an excellent wash to precede more potent antiseptics, should be rejected in the case of woven catheters, since even a short washing destroys the luster, while a longer one utterly ruins the instrument. This also holds true of carbolic acid.

Mercuric chlorid, in the strength of 1 to 1000, proved entirely efficient when it was applied to catheters which had been washed in soap and water immediately after having been infected with putrid urine. Old catheters, the inequalities of which are filled with dried albuminous substances, can be disinfected only by prolonged soaking.

Wrapping the instruments in cloth, into the meshes of which metallic mercury has been rubbed, and enclosing the bundle thus formed in a tight box, was found to be unreliable. The cultures from the interior of infected catheters thus treated for 24 hours always proved positive.

Exposure of the catheters to formaldehyde vapors engendered by an alcohol lamp was difficult of accomplishment, and unsuccessful in its results.

Exposure of the instruments to a formaldehyde vapor given off by a paraform in a closed box at ordinary room temperature proved absolutely efficacious. By this means, not only were new catheters which are always infected, and old catheters which had been dipped in putrid urine and thoroughly washed, disinfected, but also those which had been dipped in infected material, either urine or pure cultures of *staphylococcus pyogenes* or the colon bacillus and had not been washed, were rendered absolutely ster-

ile. This was proved by upwards of a hundred experiments. In corroboration of Janet and Guyon's experiments, it was found that for catheters of ordinary size, i. e., 12 to 20 F., exposure to paraform vapor for 24 hours was necessary before sterilization was accomplished. For catheters of very fine caliber, such as the urethral catheters, and for the lumina of the irrigating cystoscope, an exposure of more than twice this length was not thoroughly efficacious. In these fine instruments, however, we found that a few seconds' spraying with the Fries formaldehyde tube produced thorough and lasting disinfection, even though the catheters had not been washed after infection.

It is apparent that in paraform we have a safe and certain disinfecting means, one which is superior to formaldehyde solution, since the vapor is without moisture and hence does not deteriorate the instruments, and one which is easily managed, since it is active at room temperatures.

As to the method of application, all that is required is a box of wood, metal or any comparatively air-tight material in which the catheters can be laid, with a tray or cage provided with a fabric on which the paraform can be spread so that the vaporization may be fairly rapid. This general plan admits of almost indefinite modifications. The box proposed by Janet as suitable to the office of the general practitioner who is not often called upon to use a catheter, or to the house of a prostatic who has to catheterize himself eight or ten times, is that which I show. It will contain 12 to 20 catheters of ordinary caliber on its two perforated shelves. Beneath there is a framework on which gauze or any thin fabric is spread so that paraform may be sprinkled on its surface.

In the experiments half a dram of paraform was used, and this still preserved its disinfecting properties at the end of two weeks.

A better apparatus for the storing of catheters is that which I now show: It is simply a tin cylinder so partitioned that each catheter is kept from coming in contact with its fellow, a most important matter when the woven instruments are used. A cap fits over each end. In the bottom of one cap is placed the paraform powder. The surgeon can place his instruments in this box and let them stand indefinitely,

feeling perfectly sure that the instrument which he is compelled to introduce into the bladder will be absolutely sterile.

A form of box suitable for those who practise self catheterization is this, which is divided into small compartments, each designed to receive a catheter, and carries the paraform in a cap attached to the lower end.

The scheme of the present contribution scarcely embraces the technic of self-catheterization, though in passing it is worthy of remark that patients who are compelled to practise this procedure should have twice as many catheters as they are required to use in one day and should use a fresh one for each voiding of the bladder contents, thus allowing 24 hours for the sterilization of each instrument. This case, or one devised on similar principles, may prove serviceable to prostatics, since in its upper part are carried four catheters constantly exposed to the vapor of paraform, while in its lower part can be held a bottle of lubricant.

The catheters having been thoroughly sterilized, the next point to consider is the maintenance of this condition until they have been introduced into the bladder. This requires clean hands on the part of the surgeon, clean lubricant and clean environment about the urethral aperture and a clean urethra. The hands may be cleaned by the ordinary surgical means. This, however, is time-consuming, and when many catheterizations are required in the course of a single morning, it is extremely irritating to the skin. A much easier and more efficient method is provided by the use of clean cotton gloves. These may be rendered sterile either by steam or by exposure for 24 hours to formaldehyde vapor. The lubricant can be rendered clean by heat sterilization, and should be contained in a deep jar, in which the instrument may be dipped to the full extent of its required introduction.

Efforts to find an efficient lubricant which would be non-irritant but decidedly antiseptic were futile. The oily preparations which are from a mechanical point of view to be preferred, deteriorate rubber instruments. The soap preparations advised by Guyon, I found more or less irritating to the urethra. The two lubricants which I prefer are a form of purified liquid petro-

tum with a small quantity of menthol or oil of cinnamon added, or a 33 per cent. boroglyceride preparation. The latter is less irritating than glycerin and can be readily washed off, thus facilitating the subsequent cleansing of the catheters. Both these lubricants can be placed in deep narrow specimen jars, which can be hermetically closed and exposed to steam vapor daily. It is worthy of note that a boroglyceride preparation which had been used in the Venereal Dispensary for months without disinfection, showed very few growths on cultivation. The environment of operation may be rendered clean by surrounding it by sterile towels. The meatus and glans about it should be rubbed with a cotton pledget wet in alcohol, and after that with one soaked in mercuric chlorid solution 1:1000. Knowing that even the healthy urethra is teeming with germs and often the pathogenic varieties, an effort was made to mechanically cleanse it by irrigations with physiologic salt solution. This failed, the catheters introduced during or after this irrigation always showing abundant growths. By means of solutions of silver nitrate, however, 1: 6000, it was found that a catheter could be introduced into the bladder, and that usually from neither its inner nor outer surface could growths be obtained. Hence when the need for sterile catheterization is imperative, as in cases of retention of urine in a non-infected bladder, before introducing the sterile catheter the meatus should be well syringed out by a stream thrown into it from a distance. The catheter should be attached to the tube of an irrigator which is raised two or three feet above the level of the patient's body and should be introduced slowly while a stream of silver nitrate or argonin (which was found to be equally potent and less irritating) is allowed to flow through its lumen. After drawing the urine a second irrigation is advisable during the withdrawal of the instrument.

The box here shown is a convenient method of practising sterile catheterization. It is of tin and divided into compartments in which are contained towels and gloves. Experiments show that the 24 hours exposure to the vapor of 1½ dram of paraform renders these fabrics absolutely sterile. At the time of introducing the catheter the surgeon uncovers his jar of lubricant, if this

is used, or fastens his sterile catheter to the nozzle of an irrigating bag which contains silver solution, after having cleansed the glans penis. He then places the sterile towel in position, puts on the sterile gloves, lubricates the catheter, secures it to the nozzle of an irrigating bag, which should have been soaking in bichlorid, and introduces it, employing, if the urethra be of normal caliber and the instrument of medium size, a flowing stream of antiseptic solution as an irrigant. After having voided the urine it is always best to practise a slight irrigation, then to withdraw the catheter with a stream of antiseptic solution flowing through it.

As a further use for the paraform we found that all surgical instruments, even those of intricate construction, exposed to the vapor for twenty-four hours were rendered thoroughly sterile. Hence by storing instruments in appropriately devised boxes, they can be taken out when required for operation, wrapped in sterile gauze and used without further preparation. This method is also applicable to the sterilization of dressings. For pads or sponges it should be used only when some time has been allowed for exposure to paraform for the vapor to pass off, since it is irritating. This irritating quality will also manifest itself in catheters used immediately after using the strong vapor. Under such circumstances they should be dipped in either sterile water, or a very dilute solution of bichlorid, 1 to 20,000. When the oil lubricant is employed, this is sufficient to protect from such irritation. Probably, one of the most important considerations in the sterilization of the catheters is the securing of the proper instrument, one with a solid end and with a smooth inner surface. In this latter respect, even instruments of the best make are wanting, as is shown by the split specimen of catheters on this card. It will be noted that the only instrument, satisfactory as far as its interior finish is concerned, is the soft rubber catheter. This, I believe, should always be the instrument of choice, and would be found efficient in the vast majority of cases. I have had these catheters constructed with the Nelaton elbow, and have been able to introduce them with ease, particularly in cases of enlarged prostate where long continued and skilful efforts with other instruments proved unavailing. The reason

for this is very simple: that they are infinitely more flexible than the softest woven instruments, and can thus accommodate themselves better to the partially blocked canal. The flexibility of the great majority of soft instruments is utterly useless.

As far as the experiments go, which Dr. Patterson will detail, they seem to prove that in paraform we have the simplest and surest method of disinfecting surgical instruments, and particularly those which are perishable, such as urethral catheters.

## EXPERIMENTS IN THE STERILIZATION OF SOFT CATHETERS, AND TO DETERMINE IF THE HEALTHY URETHRA IS GERM FREE.

BY FRANCIS D. PATTERSON, M.D.

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THESE experiments were conducted for the purpose of determining the relative value of certain simple methods of sterilization of urethral instruments. The result aimed at has been to try to show which method is best in point of surety and simplicity of technic, not only for the physician, but for the layman as well.

In all the experiments, nutrient agar-agar and bouillon, prepared in the usual manner, were employed as culture-media and were kept under observation in the incubator two weeks at 37°C. The technic was as follows:

I. Sterilization of catheters: (1) *antiseptic soaps*. Four catheters (18 to 22 F.) were soaked for five minutes in putrid urine, then they were thoroughly rinsed in tap-water, after which, a culture was taken on agar from the outer surface of each catheter. In each instance a growth of bacilli and cocci resulted. Then the catheters were placed in one pint of water that previously had been boiled for twenty minutes and which contained one ounce of Johnson's Etherial Soap. They were thoroughly washed for five minutes in this solution and then dried on towels which were proved to be sterile by the negative results of cultures that were made from them. Next four bouillon tubes were inoculated by dipping the catheters into the tubes. At the end of twenty-four hours these tubes were examined and a free growth of bacilli and cocci was found to have occurred in each

one. This experiment was repeated, substituting first Stiefel's one-half per cent. sublimate soap, secondly, his kresol soap, and finally, ordinary tincture of green soap. In each tube a free growth of bacilli and cocci occurred.

In order still further to test the antiseptic value of soap, four catheters of the same caliber were soaked in water containing, in the first instance, a pure culture of the colon bacillus, and in the second, pure culture of the staphylococcus pyogenes aureus, and then the experiments were repeated. Pure cultures resulted in every tube, and in these experiments the soaps employed proved totally inefficient as a means of sterilization. The two microorganisms used were selected because experience has shown them to be often present in apparently healthy urethras.

II. Solution of *mercuric chlorid*. Two catheters of 17 F. caliber were soaked for three minutes in putrid urine, then rinsed in "tap-water," after which a culture was made on agar from the outer surface of each catheter. Both of these cultures were successful. Then the catheters were washed with tincture of green soap and water, then placed in 95° of alcohol for one minute, and, finally, allowed to remain for three minutes in a solution of mercuric chlorid—1 to 1,000 and were dried on sterile towels. Lastly, one bouillon tube was inoculated from the outer surface of each catheter, after which

the catheter was split with sterile scissors and an inoculation made in a similar manner from the inner surface. No growth occurred in any of the tubes. In order still further to test the value of this method we substituted for the putrid urine, as the means of infection, first the colon bacillus and, secondly, the staphylococcus pyogenes aureus. The experiments were then conducted in a similar manner and with equal success in each instance.

III. *Heat*.—(1) *Arnold Sterilizer*. Agar cultures from two catheters of 18 and 26 F., infected separately with putrid urine, colon bacillus and staphylococcus pyogenes aureus, gave negative results after being in the Arnold sterilizer for 15 minutes. A control experiment, made just before they were sterilized, showed that the catheters were infected, while the cultures made from the outside as well as the inside, immediately after their removal from the sterilizer, were negative, thus showing the effectiveness of the method in this instance.

(2) *Boiling*, the ebullition being continued for 5 minutes, was also successful in sterilizing catheters of 18 to 22 F. caliber, treated as in the last experiment.

Dry heat, 168° C., for 30 minutes, was tried once, and then on a catheter of 20 F. caliber, which had been infected with putrid urine. The catheter, in this case, was so burned as to render it useless, so the experiment was not repeated.

IV. *Paraform*.—Seventy experiments were made with this drug (the catheters used varying in caliber from 17 to 26 F.), as follows: The catheters were placed for 3 minutes in putrid urine (some of the urine was poured through the lumen); then they were rinsed in tap-water, and an agar tube was inoculated from the outer surface of each catheter by bringing the catheter directly in contact with the culture media. In each of these tubes so inoculated, a free growth of cocci and bacilli resulted. Then the catheters were placed in the paraform box, in which were 2 grams of paraform. The box was kept at the ordinary room temperature for 24 hours, at the end of which time the catheters were removed, and a culture made by bringing the outside of the catheter directly in contact with the agar media. Where bouillon was used, a sterile oese was rubbed over the outer surface of the catheter previously wet with sterilized water, and

then the medium was inoculated. Each catheter was then split with sterile scissors, and inoculations made in a similar manner from its inner surface. In only one of the 140 tubes thus inoculated did any growth result and that was in a tube that had been inoculated from the outer surface of a catheter, so probably this was the result of carelessness in handling that particular instrument. These culture tubes were all kept under observation in the incubator at 38° C., for over three weeks, so as to give ample time for the growth of any microorganisms that might be present.

Ten catheters varying in caliber from 18 to 26 F. were treated in the same manner as in the last experiment, except that they were allowed to remain only eighteen hours in the paraform box. This length of time did not seem to be sufficient for their sterilization, for successful cultures resulted from separate inoculations made from the outer, and also the inner surface of each catheter thus treated.

The paraform method was inefficient in our experiments, as a means of sterilizing the inner surface of catheters of very small caliber; five experiments were made with a Kelly's ureteral catheter No. 7—treated as were those in the last experiment, but in each instance a free growth resulted in the culture tubes that were inoculated from the inner surface of the catheter. The outer surface was apparently perfectly sterile, for no growth resulted. This method also failed to sterilize the lumen of a cystoscope. These instruments of small caliber were easily and quickly sterilized in the following manner: After infecting them with putrid urine they were subjected for ten seconds to the vapor from a Fries formaldehyde tube. Then a fine wire, on which was a small piece of sterile cotton, was passed through the inner surface of the cystoscope and transferred to a bouillon tube. The catheter was split with sterile scissors and inoculations into bouillon tubes were made in a similar manner. In each case there was no growth in the culture media.

Woolf, in the *Centralblatt für Krank. der Harn und Sexuel Organ.*, vol. viii, p. 285, recommends that catheters be sterilized by being placed for twenty-four hours in a 5 per cent. formaldehyde glycerin solution and then dipped in a 20 per cent. solution of sugar in glycerin just before they are used. We

tried this experiment twice, and in each instance cultures made from the outer and inner surface of the catheters (22 to 24 F.) were negative, showing that the instrument was germ free, but it was a clinical failure, as each of the two instruments thus sterilized produced a violent urethritis due to the retained formaldehyde.

*The metallic mercury method* was tested as follows: Twenty catheters, varying in caliber from 18 to 26 F., were placed in putrid urine for three minutes. Then they were rinsed in tap-water, after which a successful culture was made in an agar tube from the outer surface of each catheter. Then the catheters were placed for twenty-four hours in a cotton-flannel bag (containing 40 cc. of mercury) which was then placed in a small tightly closed box. At the end of the twenty-four hours the catheters were removed and twenty bouillon tubes inoculated from the outer surface by an oese, and twenty more in a similar manner from the inner surface after splitting the catheter with sterile scissors. Three of the catheters were apparently not affected by this method, for the tubes inoculated from them contained many bacilli and cocci.

For the purpose of determining whether or not the healthy urethra is germ free, thus allowing sterile catheters to remain so until they enter the bladder, and also to determine the best lubricant, the following experiments were made:

I. A 22 and a 24 F. catheter (sterilized with paraform) were passed into an apparently healthy urethra for two inches without first cleansing the meatus. Then the end of the catheter was brought in contact with the surface of the media in two agar tubes. An enormous growth of numerous microorganisms resulted. Then the experiment was repeated twice, but in these instances the meatus was cleansed with alcohol and mercuric chlorid solution 1 to 1000. The effect of this cleansing was apparent in the marked reduction in the resulting quantity of microorganisms.

II. In order to still further test the value of cleansing the meatus, in six cases it was thoroughly washed with mercuric chlorid solution and then with sterile water and finally with silver nitrate solution 1 to 1000. Then catheters varying in caliber from 22 to 26 F. were passed for 2 inches without lubrication. Then six bouillon tubes were inocu-

lated by dipping the end of the catheter into the media. Though a growth occurred in each tube the number of the organisms were few.

III. Then five sterile catheters from 18 to 26 F. in caliber were passed to the bulbo-membranous junction, using as a lubricant liquid petrolatum that had been sterilized in the autoclave. Then the catheters were withdrawn and the outer surface of the end brought in direct contact with the medium in a culture tube. An enormous growth of microorganisms resulted in each tube.

Five repetitions of this last experiment, except that the meatus was cleansed, showed proportionate decrease in the number of germs.

The following experiments were made, first flushing the urethra with an antiseptic solution, using the solution as a lubricant:

I. Six sterile catheters (cultures made just before they were passed proved them to be sterile) were passed to the bulbo-membranous junction after thorough flushing of urethra with silver nitrate solution 1 to 1000. As the catheter was passed this solution was allowed to flow through the catheter and to go ahead of it, thus acting as a lubricant. As soon as the catheter was withdrawn it was dipped in culture tubes. In each 6 experiments no growth resulted. Argonin and argentamin were also tried in a similar manner in aqueous solution in strength of 1 to 1000. Ten experiments with each were made without a growth occurring, but in nearly every case some irritation of the urethra was the result.

A standard sterile *NaCl* solution was tried in a similar manner in 10 cases, one quart of the solution being used in each case. Growth occurred in each instance, but the organisms were not nearly as numerous as in the cases where this flushing had been omitted.

A 1 to 1000 solution of argonin in glycerin, prepared by first sterilizing the glycerin in the autoclave and then adding the argonin, was tried as a lubricant without previous irrigation of the urethra. It was not only exceedingly irritating, but was of no apparent antiseptic value, for in each of the 4 cases numerous microorganisms grew in the B. in which the catheters were dipped immediately after being withdrawn. A similar set of 4 experiments were tried with a 1 to 1000 argentamin solution pre-

pared in the same way, and the result was that in each instance a growth resulted.

Solution of camphorated phenol in liquid petrolatum of a strength of 1 to 100, prepared by first sterilizing the petrolatum in the autoclave and then adding the camphorated phenol, was next tried in 4 cases. It also failed. In each case growth resulted and the method was so irritating as to set up a violent urethritis in one case and lesser grades of inflammation in the others.

A series of 50 experiments was made in order to determine if non-sterile towels could be sterilized by the paraform method. Cul-

tures made from these towels before they were placed in the box showed that they were covered with cocci and bacilli. After being in the box 24 hours, 50 agar tubes were inoculated by an oese being rubbed over the towel and then brought in contact with the media. Ten towels folded up were used and cultures were taken from every part of them. In not a single tube did a growth occur.

Six pairs of non-sterile gloves were similarly treated and with the same successful result.

## DISCUSSION.

DR. H. M. CHRISTIAN said the subject should be of interest to the general practitioner, as it is he, as a rule, that is called upon to receive cases of retention of urine. It is of vital importance that the catheter employed should be sterile, or as nearly sterile as possible, and above all it should not, as is too often the case, be taken from the bottom of an office drawer, in which repose, in delightful confusion, pessaries, rectal and vaginal specula, forceps, pipes, etc. The physician who, in a case of retention of urine, would take a catheter from such a receptacle, and introduce it unsterilized into the bladder, should be held accessory before the fact, in a case of manslaughter.

The paraform box described by Dr. Martin, appears to be a most valuable adjunct to the physician's office, as it enables one to have his catheters ready at all times for instant service, in an absolutely sterilized condition. This subject should be of great importance to those who, by reason of enlargement of the prostate, are compelled to use the catheter themselves. He had often felt, when prescribing catheter life, almost as though he were signing a death warrant. As the bladder in all these patients is congested, and therefore vulnerable, it is only a question of time when infection will occur. Genito-urinary surgeons know that so long as the urine, in cases of enlarged prostate, keeps clear and the bladder remains uninfected, the patient enjoys life, almost as well as any man. Misery begins with the onset of cystitis. For this reason any method that

will prevent catheter infection at the hands of patients is worthy of consideration.

Theoretically the apparatus presented by Dr. Martin is perfect so far as sterilization of catheters goes. The only fault is, that for general use by the laity, it might be considered somewhat complicated. Patients with enlarged prostates, as time goes on and they find their bladders remaining free from infection, are very apt to grow careless in this important matter. All things being equal, the simpler the methods advised the more likelihood is there of their being carried out.

Dr. Christian agrees with Dr. Martin as to the catheter. The soft rubber catheter is the only one that can be boiled, and with the condee or bi-condee curve and solid tip, it is by all odds the best instrument to put in the hands of the patient.

DR. GEORGE ERETY SHOEMAKER asked whether Dr. Martin had found any irritation from the use of a catheter which has been exposed to paraform vapor and which had not subsequently been washed. It is known that the substance is irritating if applied to the urethra in any quantity. Dr. Shoemaker also asked why the nascent formaldehyde produced by the alcohol stove failed in these experiments to produce germ destruction while paraform was successful, the active agent being the same in both cases.

DR. W. M. L. COPLIN asked whether Dr. Martin had observed any deteriorating effect from formaldehyde on rubber. He had had occasion to use it in attempts at fixation of



cultures for demonstration purposes and found that the rubber tubes used, gas rubber tubing of flexible red rubber, became intensely hard, and after use of a couple of weeks, to carry off vapor from the generator, would break without any apparent reason, though looking smooth and flexible. The same thing occurs with the rubber ring which seals specimen jars. The rubber in catheters may be of different composition. The preparations used by Dr. Coplin are much stronger than those Dr. Martin uses.

DR. EDWARD MARTIN said, in reply to Dr. Shoemaker's question, that if a strong vapor is employed, it is irritating and has to be washed off with either a sterile or some mild antiseptic solution if used immediately. As used in the box and allowed to remain for some time, the vapor is so mild, that when a lubricant is employed, the irritating quality is not marked. This is especially so when petrolatum is used; but a catheter taken directly from a strong formaldehyde vapor and dipped into a glycerin lubricant would be extremely irritant. Dr. Martin has had several rubber instruments in vapor for a year, and they have shown no deterioration, though the vapor is extremely mild as compared with

the solutions used in laboratory work. If the rubber is put in the box while wet, it is probable it might be injured, but the instruments are dried before being placed in the box; all rubber instruments deteriorate under moisture. The majority of instruments used are those of the woven variety, in which the fiber is coated with shellac. In regard to the experiment with the formaldehyde stove, it is a mechanical difficulty to which he referred, the plan is clumsy, but the antiseptic effect produced is good. The sterilization of surgical dressings and instruments by this same method was equally efficient. Its principal value seems to be its simplicity, permitting one to take his instruments and feel they are at once sterile. The great temptation is, when in a hurry, to snatch up an instrument and take risks on it, and it is a satisfaction to know that one's instrument is clean when one takes it for use. As to keeping the bladder sterile, the most important matter is gentleness and the selection of suitable instruments; the next in importance is the judicious use of irrigation and, finally and least important, the sterilization of the instrument.

## THE FIFTY-FIVE YEARS OF EXISTENCE OF THE NEW YORK SOCIETY FOR WIDOWS AND ORPHANS OF MEDICAL MEN.

ANDREW F. CURRIER, M.D.

Read January 26, 1898.

IT is with some diffidence that I appear before this audience in this *city of brotherly love*, with a local charity in a neighboring city for a theme. Not that the theme is uninspiring or uninteresting to me, for I hope to be able to show that the work which has been accomplished during these years, quietly and without flourish of trumpets, without even the knowledge of the greater portion of the medical profession of New York, has been such as to excite emotions of gladness and gratitude in the mind of any one who has the welfare of his fellow-beings at heart. The trouble is, we are so accustomed to associate the two notions, *Philadelphia* and *charity*, as synonyms, that a stranger who may venture to teach or to preach there upon that subject seems a presumptuous fellow, with a large load of coals, *en route* to Newcastle.

I shall throw myself entirely on your hospitality, and beseech you to "lend me your ears" for a brief period. The more consideration on your part will be necessary, for, together with facts, I must introduce certain figures, and statistics of all sorts are an abomination to most men, and so I beg of you to hear me patiently.

The chief objection which can be offered the society whose history is to be narrated this evening, pertains to its name. It is like a German sentence—you forget at the middle what you were talking about at the beginning, and by the time you have reached the separable prefix at the end all that precedes is like a mist or a dream.

Mark Twain's suggestion on this subject to some friends in a German city is quite to the point. He said that when he wished to gain a thorough knowledge of a German sentence, he took it to one of the city bridges, laid it tenderly along the railing, from one

end of the bridge to the other. He then stood off and admired it, and then walked back and forth, studying the different parts and relations until he had it by heart.

The name of "The New York Society for the Relief of Widows and Orphans of Medical Men," or the "Widows' and Orphans' Society," as we are in the habit of calling it, while not exactly a *multum in parvo*, stands precisely for the objects and aims for which the society exists. It is benevolent, but it does not seek to pauperize its beneficiaries. It is, to all intents and purposes, a relief society, and if its beneficiaries find that they can derive their entire support from their annuity, so much the better; but the primary object of the society's charity is to *assist* in the support of the widows and orphans of deceased members, not to assume the entire burden of their support, especially if they are able to help and support themselves, or have friends to whom they can properly apply. One of the greatest blessings of the society has been in its relief to the aged, whose friends have all died, or have dropped them off, or are helpless to aid them. It is pitiable that the widows of doctors so often are thus stranded; it is praiseworthy and highly creditable that the members of the profession so seldom turn a deaf ear to the appeals of the widows and orphans of deceased colleagues, when they are in a position to aid them. I yield this tribute the more gladly, because it seems to me there is no profession in which jealousies, envyings, disagreements and detractions are so common as in ours. Doctors too often wait until a colleague is dead before they speak of his good qualities, and when he is dead, his faults are forgotten and forgiven.

The want of cohesiveness in the profession

is the cause of its greatest loss of power. If it could be remedied, we could not only increase manifold the effectiveness of our charitable and scientific undertakings, but we could overcome some of the great evils by which we are victimized collectively and individually, including the hospital and dispensary abuse, and the impositions and dishonesty of so many who take advantage of the benevolent aspect of the physician's calling. If, in narrating the history of the Widows' and Orphans' Society, I should be repeating facts with which some of you are familiar, my excuse must be that to many of you these facts are not known.

The society originated in the mind of the late Dr. Edward Delafield, one of the most distinguished New York physicians of the last generation, its prototype being the London Society, which was organized in 1788, and on lines after which ours has been modeled. This good man cherished the thought a number of years, and when his ideas were matured, he gathered at his house, March 30, 1842, a number of gentlemen, whose names are classical in the annals of medicine and surgery in this country. The subject of the needs and value of such a society as was proposed was discussed, and a committee appointed to call a public meeting of the profession for further consideration. Such a meeting was held at the Library of the New York Lyceum of Natural History, 563 Broadway, May 14, 1842.

At this meeting Dr. Valentine Mott served as chairman and Dr. Henry D. Bulkley as secretary, and a constitution as a basis for the new society was offered by a committee, of which Dr. Delafield was chairman, and was accepted by the meeting. Subscribers to this constitution, to the number of nearly one hundred, were obtained by a canvass of the profession, and on the afternoon of October 8, 1842, a meeting was held at the College of Physicians and Surgeons in Crosby Street and a permanent organization effected, Dr. Delafield being elected president, Drs. Revere, F. M. Johnston and Stearns, vice-presidents, Dr. Isaac Wood, treasurer, and Dr. H. D. Bulkley, secretary. Twenty managers were also elected, thus completing the first board of officers.

In this way the Society was launched, its chief hold being the idea of its necessity and the confidence of its future in the minds of the strong men who organized it and stood

behind it. Its course during these fifty-five years has been mainly a quiet, unobtrusive one. Nineteen times, however, it has emerged from its retirement and indulged itself in a public dinner, and though good fellowship always abounded on such occasions the thought that was uppermost, or at least conspicuous, in all the entertainments except the last, was that they were intended to increase the funds of the Society. It was one of the original by-laws of the Society that these dinners should be given annually, but, like all other occasions which are celebrated periodically, the interest varied from year to year; some years the dinner was omitted, and in 1870 the by-law relating to the annual celebration was rescinded. Our last convivial occasion was in April, 1892, when our jubilee was celebrated. We were fortunate in having with us at that time, hearty and vigorous in his robust age, our Nestor, Dr. Samuel D. Hubbard, one of the founders of the Society, and the last link which bound us to the past. (Dr. Hubbard is now dead.)

A public dinner, to the average New Yorker or Philadelphian of half a century ago, was much more of an event than it is now. Organizations which indulged themselves in that way were fewer, appetites were keener, and to judge from the ponderous bills of fare of the Astor House, the New York Hotel, and the Metropolitan Hotel, of those days, digestions must have been better, and dyspepsia rarer than at the present time. The community was comparatively a small one, the doctors were not pampered and gilded idlers, and the dinner of the Widows' and Orphans' Society was talked about weeks beforehand, and for weeks afterward—by the survivors.

I have observed from the records that the restraining and subduing influence of the clergy was always felt at these dinners. Not so with the bar, though the landlord of the New York Hotel, where the second dinner was given, November 26, 1845, said he had never met with so temperate a body of men. The speaking was frequently fine and exhilarating, and distinguished guests from out of town were often present.

Donations to the funds of the Society were always expected, the largest amount that I can find (\$6,080) having been given at the dinner at the Astor House in 1854.

It is noteworthy that during the financial depression of 1857 the dinner was omitted,

and again in 1862, on account of the distressed state of the country at that period of the war of the rebellion.

Another fact that is most worthy of note concerning these dinners is that at the one in 1846 the Academy of Medicine had its birth, a committee consisting of Drs. Stevens, Valentine Mott and Isaac Wood being appointed to issue a call to the profession, and another committee of fourteen to submit a plan of organization and draw up a constitution and by-laws. The meeting was held December 12, 1846, and adjourned to January 6, 1847, when two hundred and fifty physicians enrolled themselves as the New York Academy of Medicine, the objects of which were to be: (1) The cultivation of the science of medicine; (2) The advancement of the character and honor of the profession; (3) The elevation of the standard of medical education; (4) The promotion of the public health.

Upon this foundation, the New York Academy of Medicine has been a most useful factor for half a century in the development of our city and country, and if this Society's dinners had accomplished nothing else, this alone might be brought to public notice as a most desirable achievement.

The familiar truth is again illustrated in this fact, that we can never foretell the grand results which may flow from the simplest means. The specific work, for which the Society was founded, did not begin until 1852. There had, therefore, been ten years of preparation, in which a good start could be made. Doubtless, there were those who regarded these as barren years, and questioned the utility of such a society for the medical community, but the wise men who founded it, knew better, and were confident that all the strength which it could gather would some day be required.

At this time (1852) the funds of the Society amounted to about \$14,000. The widow who applied for relief, whose husband had been a member only three years, was awarded an annuity of \$100, and \$25 was given annually to each of her four children under 14 years of age. Relief was continued to this lady until her second marriage in 1868, and to her children until they reached the age when, according to the by-laws, assistance must cease. A total of \$2,790 was paid to this first annuitant and her children, her husband's total payments to the treasury

of the Society having been \$40. (About two years ago this lady, having lost her second husband, applied to me, as secretary, to be placed again upon the roll of annuitants, but a useful provision of our by-laws prevents relief after remarriage, unless the second husband happened to be a member of the Society, and was marrying for the first time.)

Unless the Society had accumulated during these ten years of preparation, continuous relief could not have been extended without assessments upon the members (which has never been practised), or diminution of the annuity.

The work of such a society must always be limited in its scope, and during its early history, with almost no expenses, nearly its entire income was consumed by the annuitants. The second annuitant, whose husband had also paid but \$40 into the treasury, derived \$6,615 during a period of 24 years. The third, whose husband paid \$250 (having made himself a benefactor and a life member of the Society), received \$3,652.50 during 28 years. The fourth, together with a child, received \$2,660.84 during 11 years, her husband having paid \$100. The fifth, a hale and hearty veteran, is still on our rolls after 36 years of continuous assistance. Her husband paid \$40 to the Society, and she has drawn in return \$12,590. Who shall say that membership in this Society does not contribute to longevity in widows?

From 1852 until the present time 33 widows, 31 children and 1 sister have received relief. This number is not large, although it is 16 per cent. of all who have ever been members, but assumes greater importance when we reflect that all of these individuals received all or a large portion of their support from this source. Regarded from such a standpoint, the great utility of this Society cannot fail to be apparent. Furthermore, when it is realized that in 45 years the Society has paid its beneficiaries, in round numbers, \$127,000, that the expenses of administration during these years have been insignificant, and that not a dollar of its funds has ever been lost or misapplied, it may fairly be asked, what beneficial society can show better results for moneys deposited in its keeping? Such results ought to go far to set aside the slander that doctors are bad business men, for its finances have been managed by none but its members. It has

had 24 presidents, among them some of the most distinguished men in the medical profession; 5 treasurers, and 7 secretaries. Three of its presidents died in office. The widows and orphans of 1 president, 1 secretary, 1 treasurer, and 2 or 3 members of the board of managers are found in the list of beneficiaries, otherwise the only service rendered by members whose families have received relief has been the payment of their dues. In other words, those who have carried the burden of the Society have derived benefit or return only in exceptional cases. The husband of one of the annuitants never paid a dollar to the Society, but was made a life member at one of the dinners by a generous friend. This annuitant has drawn more than \$6,000 during 21 years.

There have been less than 400 members in this Society from the beginning, and there are now about 140.

It has not been the policy to urge physicians to join, especially in recent years, if its merits did not sufficiently commend themselves to them. Should the membership become very large and the number of annuitants large it would probably necessitate a reduction in the annuity, and this must be avoided, if possible.

The London Society, after an existence of a century, had accumulated (1894) a fund of \$440,286, but it had a membership (1894) of 312 and relieves 58 widows and 12 children. Each widow, if destitute, receives \$275 per year, and each child \$70.

The widows of the New York Society receive \$400, if destitute, and the children \$100. In 1897 there were 15 widows and 4 children who were receiving assistance.

The funds of the New York Society amounted in 1897 to \$225,615.44, the increase that year being \$5,095.51.

The amount paid to annuitants last year was \$4,582.11, and the total for running expenses was \$513.40.

The initiation fee is \$25, the annual dues \$10, but life membership is obtained by a single payment of \$100. After a member has paid annual dues 20 years his dues cease and he becomes a life member.

The income last year from dues of annual members was only \$350, not enough to pay a single full annuity.

The accumulations have come from judicious investments, from legacies amounting to about \$45,000, of which Dr. Alonzo Clark

left \$20,000, and from contributions by members. About fifty have made themselves benefactors by the payment of \$150 each.

The question naturally suggests itself, what is to be the future of this organization? We may say, first of all, that, judging from the past, it has earned its right to existence and to the confidence and affection of the profession. Wise in its discrimination as to its beneficiaries, regardful of their feelings, encouraging self-help, what fundamental conditions could be more praiseworthy in the conduct of a society of this character? The membership is small and increases slowly, the same as with the sister-society in London. It has often appeared strange to those of us who are conversant with the advantages which are offered, that membership should be sought by so small a number of our colleagues.

That seems to be the history of relief and benefit societies in the medical profession everywhere, lending color to the oft-repeated statement that doctors are improvident and careless of the future. But, as I have stated before, smallness of numbers and slowness of growth only add to the security of the financial foundation upon which the society rests and insure the prompt and easy payment of obligations to present and prospective annuitants.

If it should happen that the number of applicants for membership in the society should be very large, it would seem probable that the dues must be increased, the conditions for membership made more rigid, or the annuities diminished in amount; the expense-account has never been a matter of much importance and is not likely to be.

But I do not anticipate that any such condition will occur, and we shall probably continue on our quiet way for the next half-century much as we have in the past.

I was not asked, and presume I was not expected, either to admonish or encourage the society, by whose gracious invitation I enjoy the honor of addressing you. But I am sure you will not take it amiss that I express great pleasure in the knowledge that you have a society in Philadelphia, in which we recognize a younger sister to our own. In behalf of my fellow-members, I beg to bring you greetings, and to wish for you the largest measure of usefulness and prosperity.

## REMARKS.

REV. DR. KRAUSKOPF spoke by special invitation of the "Needs of the Widows and Orphans." He regretted exceedingly to be obliged to criticise a culpable neglect of which, as he heard to-night, and had been informed before, so many physicians are said to be guilty—the insufficient provision for widow and orphans, by the medical man in the case of death. It was a very serious charge, and one that if more generally known would tend to undermine the confidence and the trust which the public placed in the medical man. He who did not evince sufficient care and foresight towards his own wife, towards his own children, would certainly not be credited with having greater concern for outsiders. Serious as this charge would be against any husband, against any father, it was especially serious when the husband and father was a medical man, for the physician when he takes upon himself the duties of a husband and a father takes at the same time upon himself the most serious responsibility. For the privilege of being wedded to a medical man many a young woman of superior qualities, of superior endowments, left a home where plenty abounded, where every whim was gratified, passed through years of struggle, sometimes through years of want, before a foothold was obtained on the frail and slippery ladder of success. Instead of there being a fixed income, as in some of the other professions, notably in the Church, there was generally a fixed determination to distrust and discredit a young rising physician, and so he and his poor wife and their poor children were often obliged to swallow many a bitter pill before he was privileged to prescribe pills for other people. He and his poor wife and his poor children were often obliged to sit down to a scanty meal before he was privileged to prescribe the diet for other people. And many a time must he feel that he was more deserving of charity than were some of his charity patients.

And when a foothold was obtained at last, how many sacrifices must be made by such a wife for the great privilege of having been wedded to a medical man! What separations must be endured, what dangers must be braved, what difficulties must be put up

with, because being a public man he must be at the beck and call of the public, morn and night, week days and Sabbath, all seasons and all kinds of weather, and during all those times that a man can claim just, reasonable leisure, a physician's wife and children must often be neglected. The profession at best, barring the few exceptional cases, was not a very lucrative one; there was the necessity of trying to keep a respectable household. The bank account was often very small, or there was no bank account at all. And when death suddenly came there were left a widow and children to pay with life-long poverty for the privilege, for the honor, of their relationship to a medical man.

If he understood it aright, the ethics of a Medical Code required a physician to respond to every urgent call. He believed that such a call was extended to every physician every morning, noon and night by his own wife and by his own children, to become a member of the Mutual Aid Association. If he turned a deaf ear to that call, if he did not heed the call of his wife and children, not only of his own wife and children, but also of the wives and children of his brother physicians, he was false to the ethical code of the medical profession. By refusing the strength of his arms to the Mutual Aid Society he prevented many a thousand dollars from coming to its fund, by means of gift, bequest or legacy. Why should an outsider remember the needs of the widows and the orphans of medical men when they themselves displayed so little interest in them?

DR. CHARLES A. LEALE, President of the New York Society for the Relief of the Widows and Orphans of Medical Men, was introduced and said:—

*Mr. President, Ladies, and Gentlemen:* We, of the New York Society for the Relief of Widows and Orphans of Medical Men, extend our hearty greetings and fraternal love to all assembled here this evening; sincerely trusting that your efforts will be followed by gratifying results. Yesterday I received in New York City your program for this evening, and after reading it decided to speak on the permanent fund, without which our society could not have continued to exist, as it has done, for more than 55 years. It is the

interest from these invested funds that enables us to distribute to the worthy widows and orphans of medical men financial aid sufficient to supply their wants. The permanent fund was started by Edward Delafield, who in 1851 became our first benefactor, giving us \$5,000. This was followed in 1855 by \$5,000 from Edward E. Beadle, also the same year by \$1,000 from Abraham Dubois; again in the same year Jacob Harsen gave us \$10,000; while in 1864 Alonzo Clark commenced his benefactions which continued until he had added \$30,000 to our permanent fund. Next came Samuel Abrahams, who in 1882 gave us \$2,248.

Of the \$61,098 contributed in large sums to our permanent fund more than \$60,000 was given by physicians. Other donations have followed, and now we have over a quarter of a million dollars, securely invested, to the credit of our permanent fund. From the interest of the fund we have liberally distributed a large sum of money to our widows and orphans. The conditions of applicants are carefully investigated by our members, their reports are submitted to specially chosen committees, who adjudicate, subject to the final action of the Board of Managers.

We are always punctual in the payment of our annuities. A widow may calculate, a year in advance, the day on which she will receive her means of support, and an orphan may continue at school relying upon the punctuality of our treasurer.

All payments are made in accordance with our by-laws, and each check is signed by the president and treasurer. Our Society has always been managed by medical men, who have first been chosen as members of the Society, and subsequently selected as managers. Every one of our presidents and treasurers since our organization, has been an owner of real estate in New York City. The officers and managers have willingly worked gratuitously for the benefit of the widows and orphans.

Each widow receives an annuity of at least \$400, and an orphan, while under age, \$100. This distribution is made without the publication of any names of the widows or orphans.

In response to questions, Dr. Leale also said: It would be impossible for us to admit all who applied. Otherwise we would have flocks of physicians come to us from all parts of the country. The application is made

to any member. We have a written form. This is filled by the man's name, wife's name, names of each of his children and their ages, and his general condition, and so on. This is submitted to a special committee and reported on favorably or unfavorably. It is referred to the Board of Managers; they decide whether the applicant shall be elected or not.

In regard to the relief of members themselves no longer capable of self-support: If a member becomes poor, we give him aid. If he has a father or mother dependent upon him for support; if his brother or sister were supported by him during life, we have a provision in our by-laws to do what he did during his life.

Care is taken to see that applicants are reasonably healthy.

We have a woman physician who is a member of our Society. If her widower became distressed, he would have the same right to help as the widows.

REV. DR. CHARLES WOOD, who spoke by invitation, did not know where one could find a better definition of religion than that which was given in the Bible, a part of which was embodied in the work of this association: To visit the fatherless and the widow. That was what the association was trying to do. It was visiting the fatherless and the widows, and, just as far as possible, was trying to have a comfortable little home, or at least a lodging place where they could be visited.

He could not imagine any class of widows or orphans in any community that would appeal to sympathy more than the class who had been brought up in homes of high culture, where they had been familiar with the great problems of the day; and suddenly, it might be, the home was broken up, the widow thrown out upon the world, which is hard and cruel at best, to take care of her children. The same sort of circumstances, that might be distressing to people differently educated and trained, were heart-rending to such a widow and her children. He felt that these widows and orphans—who, if their husbands and fathers had lived, would have had everything that heart could wish, and good splendid men to love and honor, who could care for them and see their wants supplied—should not be suddenly thrown out to become absolute paupers.

The men of large means and men of

smaller means ought to see that associations like this were well cared for. He was told, some time ago, of a widow of a doctor who put up a monument to her husband, right in the center of a cemetery where there were a good many of his patients buried, and she told the cutter to put on it the inscription: "Reader, if you would see his monument, look around." He believed the time was coming when—when for the good doctors who organized this association and who supported it—if we wished to see their monument, we would not have to go to a cemetery, but look around and see widows and orphans in comfort, though not in luxury. They being dead would yet speak, and their works would follow them.

Dr. Leale stated there was also The Physicians' Mutual Aid Association of New York City, somewhat different from the Society called for the Widows and Orphans. It has about 1,500 physicians among its

members. An assessment is paid, if necessary, at the death of each member. The family of the member upon his death, without question in regard to the financial ability of that family, receives a check of \$1,000.

Physicians who are likely to die within a week or two would not be admitted, but ordinarily any member of the County Medical Society or Academy of Medicine was admitted even when infirm and likely to die in a comparatively short time.

DR. CURRIER said there were a certain number who were assisted by these two societies combined. There was a question at one time of coalescence, but it was thought that perhaps each had its work to do, and perhaps the success of both had been justifiable cause to continue them as they were.

In regard to membership in the Widows' and Orphans' Society, 60 years was the limit beyond which no one is admitted, at 55 the charge is somewhat larger.



# BENEFICIAL EFFECT OF METHYLENE BLUE IN THE TREATMENT OF ACUTE GONORRHEA, AS EXEMPLIFIED IN ONE HUNDRED AND FIVE CASES OF THE DISEASE, WITH SPECIAL REFERENCE TO THE GERM-DESTROYING ACTION OF THE REMEDY ON THE GONOCOCCUS.

BY ORVILLE HORWITZ, B.S., M.D.

Read February 9, 1898.

So many remedies for the treatment of gonorrhea are being continually brought to the notice of the profession, with claims by their advocates to be specifics, but which, after fair trials, are found to be valueless, that one naturally hesitates to present another. The remarkably antagonistic action which is found to subsist between methylene-blue and the gonococcus, seems, after a somewhat extended investigation, to warrant its recommendation as a remedy which, it is believed, will prove of real benefit in the treatment of gonorrhea.

Some time since, Dr. Coplin, Professor of Pathology, Jefferson Medical College, called the writer's attention to the presumed germicidal action of methylene-blue on the gonococcus, and expressed the hope that investigations would be instituted with a view to ascertaining its value as a remedy in acute specific urethritis. In order to test the utility of the proposed remedy, 105 cases of specific anterior urethritis were selected for treatment; 73 were taken from the genito-urinary department of Jefferson Medical College Hospital; 32 from private practice.

A careful bacteriologic examination was made in each case by Dr. Howard F. Pyfer, the experienced bacteriologist of the genito-urinary department of the institution, with most interesting, and in many cases remarkable results.

Merck's preparation of methylene-blue was chosen for experimentation. It was given in doses of two grains three times daily. In about one fourth of the cases

this quantity produced slight diarrhea, accompanied by more or less strangury; when this condition pertained the doses were reduced one half. In no instance did the administration of the remedy in one-grain doses produce untoward results. When permissible, two grain doses were found to be more effective than half that amount; the larger quantity was therefore prescribed when the patient could bear it. It was found that nutmeg combined with the remedy served in many cases to prevent the development of diarrhea and strangury. In every instance, shortly after the administration of the remedy, the urine became tinged with a deep blue color.

In a majority of the cases, when the remedy had been administered for the period of four or five days, the profuse purulent discharge was changed to a slight mucoid excretion, with an abatement of all inflammatory symptoms. Frequently the discharge entirely disappeared by the end of the second week. In but one case did it recur. Here the individual, whose discharge had ceased at the end of the second week, believing himself cured drank freely of beer. A return of the ailment resulted, and later, a slight epididymitis developed. Of the 105 cases treated with methylene-blue this is the only one in which any complication or drawback occurred.

When experimenting with the balsamic remedies that are administered in the treatment of gonorrhea, in conjunction with methylene-blue, it was found that the best

results were obtained by combining copaiba, sandalwood, and salol, administered in capsules.

The following is the formula usually employed:

Methylene-blue.....	2 grains.	
Oil of sandalwood.....	3 grains.	
Oleo-resin of copaiba.....	3 grains.	
Oil of cinnamon.....	1 drop.	
Dispense in capsule. One dose.		Mix.

When this combination was administered, the purulent discharge, together with all inflammatory symptoms, usually disappeared within four or five days.

Potassium permanganate in solution was employed as an irrigation, beginning with a strength of one part to two thousand, gradually increased as the symptoms abated, until the proportion reached one part to one thousand.

When the discharge continued merely as a mucoid excretion, it was found that the astringent injection producing the most beneficial effect was the following:

Zinc sulfate.....	16 grains.	
Plumbic acetate.....	$\frac{1}{2}$ dram.	
Tincture of opium.....	$\frac{1}{2}$ fluidounce.	
Fluid extract of krameria...	4 fluidrams.	
Water sufficient to make....	6 fluidounces.	
Shake, and use locally.		Mix.

This injection is not to be immediately discontinued upon the cessation of the discharge. The patient should be instructed to add a syringeful of water to every syringeful of the solution that has been abstracted, and thus gradually diminish the strength. This method of dilution should be continued from seven to ten days after the discharge has entirely ceased. At the termination of this period, if the urine be clear, and free from the small thread-like bodies known as "tripper faden," the treatment is to be discontinued.

The time occupied in the cure of the 105 cases selected for treatment is shown in the following table:

Number of cases.	Time in which cured.
1.....	2 weeks.
10.....	2 $\frac{1}{2}$ "
66.....	3 "
16.....	4 "
5.....	5 "
6.....	6 "
1.....	7 "
105	29 $\frac{1}{2}$

By inspecting this table it will be seen that 66 cases of the 105 were cured in 3 weeks; 1 required 7 weeks—that of the individual who indulged in beer-drinking and in whom epididymitis developed. One hundred and four cases recovered without any complication.

The bacteriologic report of Dr. Pyfer is exceedingly instructive and interesting, as is shown by the following extracts:

"A careful study of the cases in which methylene-blue was employed for the treatment of acute gonorrhea showed that when there was a profuse discharge containing a large number of pus cells, gonococci were found in the cells and were present in great quantities. No case was considered one of true specific urethritis unless gonococci were found in the pus cells. The duration of the disease was from one to fourteen days. Between the first and the fourth day of treatment the discharge generally changed to a slight mucoid excretion.

"In some instances a few gonococci could still be found between the eighth and twentieth days of treatment, but in the majority of cases they could not.

"In many individuals the discharge was very profuse when first seen, but at the end of the fourth day was scarcely sufficient to tinge the slide for examination.

"In those cases in which the methylene-blue was discontinued prematurely, the discharge generally returned at the end of the week. On examining the pus procured from the urethra of individuals who had been under treatment for twenty-four hours, it was remarked that there was a decided diminution in the presence of gonococci. They appeared to be smaller in size and shrunken.

"In cases of non-specific urethritis, that is, cases in which, after many careful examinations, gonococci could not be detected, no benefit was derived from the exhibition of methylene-blue.

"The method of staining was that recommended by Professor Coplin; it consists in first fixing the pus on the glass, by passing the slide through a flame, and then placing an alcoholic solution of eosin on the slide, and gently heating it for ten or fifteen minutes. The slide is then treated with water until the washings are concluded, after which an aqueous solution of methylene-blue is dropped on the slide and allowed to stand two or three minutes, when it is again slowly

washed, slowly dried, and mounted in balsam. Gram's stain was not employed; Dr. Coplin's method being deemed more satisfactory.

"A few cases of chronic urethritis were treated with methylene-blue, and in those instances in which gonococci were present in the discharge, marked benefit followed the employment of the drug.

"When a chronic discharge existed, such as is due to granular patches, strictures, or similar conditions, and gonococci could not be detected, no benefit followed the administration of methylene-blue."

The writer, having presented in detail his experience with methylene-blue in the treatment of gonorrhea and the results of Dr. Pyfer's examinations, believes that he is warranted in stating the conclusions at which he has arrived.

(1) That methylene-blue is a germicide of great value in cases of acute urethritis, due to the presence of gonococci.

(2) That it will not abort the disease, but will materially shorten its duration.

(3) That it markedly lessens the tendency to complications.

(4) That it is not to be employed in the treatment of acute urethritis, unless a bacteriologic examination demonstrates the existence of gonococci.

(5) That the remedy should be employed as soon after the infection as possible.

(6) That the proper dose with which to begin treatment is one grain three times daily, to be increased to two grains if the remedy is well borne.

(7) That the beneficial action of methylene-blue is enhanced and the duration of the disease is shortened by combining it with copaiba, sandalwood, and salol.

(8) That the injections of potassium permanganate by means of a hard syringe, or if possible by irrigation, administered in the early stages of the disease, and followed during the period of decline by an astringent injection, have a marked tendency to lessen the duration of the malady.

(9) That methylene-blue always has the effect of turning the urine to a deep blue color. Of this fact the patient should always be informed to prevent unnecessary alarm.

(10) That methylene-blue is of no service in cases of non-specific urethritis.

Irrigation of the urethra with methylene-blue in cases of acute gonorrhea is now being made the subject of investigation by the writer, but as yet he has not elaborated sufficient data to enable him to submit the result of his research to the profession.

## DISCUSSION.

DR. H. M. CHRISTIAN said the figures presented by Dr. Horwitz were striking and interesting to anyone dealing largely with gonorrhea. If he recollected correctly, Austin Flint wrote in the *New York Medical Journal* of July, 1895 or 1896, of the use of methylene-blue in the treatment of gonorrhea. Dr. Flint reported only six or seven cases, and suggested further investigation. Upon reading this article, Dr. Christian tried methylene-blue internally in his service at the University of Pennsylvania. He did not have the striking results now reported by Dr. Horwitz, but he had used methylene-blue alone. If the exact value of a drug is desired that drug must be used to the exclusion of everything else. Hand-injections of potassium permanganate, or local treatment of any kind, impairs the value of statistics in regard to the drug used

internally. Dr. Christian tried the internal administration of methylene-blue in not more than 15 or 20 cases. He found the discharge in these cases about the same as under the internal administration of salol, possibly slightly less.

According to the statements made in his paper, Dr. Horwitz used in his experiments methylene-blue in combination with oil of sandalwood and balsam of copaiba. Dr. Christian did not see how it was possible to ascribe the good results following the use of such time-honored remedies as sandalwood and copaiba to the fact that methylene-blue had been added.

DR. J. T. RUGH, while disclaiming much experience in the treatment of these cases, mentioned that he had charge of a case of chronic gonorrhea which had extended over a period of six or eight months, and had

been present, at intervals, for four or five years. As a last resort, the formula given by Dr. Horwitz was used, but not the injection. Complete cure was effected after six weeks' treatment. It is now about two months since the discharge entirely ceased, and, in spite of the fact that the patient's habits have since been such as would tend to provoke a return, this has not occurred.

DR. NIGHTINGALE did not wish to be thought an opponent of Dr. Horwitz's treatment, but he spoke of a case that had presented at his own office on the 4th of January. It was one of periurethral abscess. The man said he had been treated by Dr. Horwitz with the "blue." Dr. Nightingale operated that night and recovery ensued in due time. The original discharge had stopped before the abscess was formed. When the patient was practically well of his abscess, profuse discharge from the urethra recurred. This was treated with potassium permanganate and the case was progressing favorably when

last seen, five or six days ago. The patient admitted free indulgence in alcohol before the return of the discharge.

DR. HORWITZ replied, that he thought that Dr. Christian misunderstood the drift of the paper. It dealt with the use of methylene-blue alone in 105 cases and it had been said that the other materials mentioned were found to enhance the value of the remedy in other cases. It was not claimed that these cases were cured, but that the discharge was controlled. It does not follow, because the discharge is completely controlled and the gonococci disappear, that the person is immediately well. But, it is claimed that, according to the bacteriologic researches, the gonococci disappeared under this treatment and that complications did not occur. After experimenting with these 105 cases and establishing the efficiency of methylene-blue, it was then tried with the remedies mentioned and it was found that the combination greatly added to the value of the treatment.

## A CASE OF HYPOPYON KERATO-IRITIS OCCURRING IN A PATIENT DURING AN ATTACK OF TYPHOID FEVER.

BY CLARENCE A. VEASEY, A.M., M.D.

Read February 9, 1898.

In a recent paper by Charles Steadman Bull, of New York, concerning the ocular complications of typhoid fever, the statement is made that the order of frequency with which these complications occur is as follows: Conjunctivitis of the catarrhal type, phlyctenular conjunctivitis and keratitis, loss of accommodation and dilatation of the pupil, retinal hemorrhages of various kinds, paralyses of the external ocular muscles, neuro-retinitis, or retro-bulbar neuritis and inflammations of the uveal tract. Among the latter, or the most infrequent complications, belongs the following case:

K. S., aged 53 years, a widow, had been ill for three weeks with typhoid fever, complicated with catarrhal pneumonia and jaundice, when I was requested by her physician to make an examination of her eyes. The right eye had been inflamed for two weeks, during which time there had been constant severe pain in the eye itself and throughout the right side of the head extending to the occiput. The dread of light had also been very marked, and these two symptoms had been partially relieved by daily hypodermatic injections of morphin and by keeping the room darkened. The patient had recovered from the pneumonia, the jaundice had almost disappeared and the typhoid fever was abating, it being then the beginning of the fourth week of the disease.

Examination of the eyes showed a marked serous iritis in the right eye, with annular synechia, pupil 2 mm. in diameter and dilating but little after repeated instillations of cocain and scopolamin. The visual acuity equalled the counting of fingers at 2 meters. There was slight hypopyon. No

view of the fundus could be obtained. In the upper inner quadrant of the cornea, at the corneo-scleral junction, there was an ulcer about 4 mm. long and 2 mm. broad. Between this and the center of the cornea there were several spots of infiltration (probably abscesses). The treatment advised consisted of hot compresses to be employed for thirty minutes every two hours, leeches to the temple, thorough cleansing with a saturated boric acid lotion every two hours and the instillation of one drop of a solution of atropin sulfate (4 grains to 1 fluidounce) every four hours.

One week later I was requested to see the case again, when the pupil was found to be widely dilated, except a small synechia below. There were numerous pigment spots on the lens capsule and a number of opaque spots on the posterior surface of the cornea. These latter were not the spots ordinarily seen in serous iritis, but much larger and much more opaque, it being impossible to distinguish whether they were deposits of lymph or thickened pus. There was marked pericorneal injection, intense shrinking pain upon making the least pressure through the closed lids, and in the corneal substance were found several opaque spots (not yet ulcers) occupying not only the upper and inner quadrant but also the lower and outer quadrant. The ulcer was a trifle larger than when first seen, the amount of pus in the anterior chamber remaining about the same. The administration of quinin was added to the treatment advised at the previous examination.

Four days later the ulcer was decidedly larger and the hypopyon so much greater that all portions of the former were cauter-

ized with the actual cautery, and the hourly cleansing with a solution of formaldehyde (1:2000) was suggested. A note from the attending physician, received nearly a week after the operation, stated that there had been no pain since the application of the cautery and that the opaque spots were disappearing from the cornea. The hypopyon had also disappeared.

In less than a week from the reception of the note the patient was brought to my office. The visual acuity of the right eye equalled  $\frac{3}{80}$ ; of the left,  $\frac{1}{8}$ . The eye was quiet and the ulcerative process had been checked. There remained a small synechia below. Massage with yellow mercuric oxid ointment, in which atropin had been incorporated, was now employed to clear the corneal opacity.

Two and a half weeks later there was a

recurrence of the ulceration near the original place in the upper and inner quadrant, which soon subsided, however, from the use of atropin and frequent cleansings with the solution of formaldehyde.

Ten days later the eye was entirely quiet and the ulcer entirely healed. One month later the vision in each eye equalled  $\frac{1}{8}$ ; that of the left being  $\frac{1}{8}$  with a correcting glass, while that of the right could not be improved. There were no lesions of the eye grounds.

The case, though an isolated one, is recorded, first, because of the infrequency of its occurrence, and second, because it serves to remind us that in all cases of disease in which the vital forces are markedly impaired, or in which there is a possibility of an embolic process taking place, the condition of the eye should be carefully watched.

## ADDRESS OF THE RETIRING PRESIDENT OF THE PHILADELPHIA COUNTY MEDICAL SOCIETY.

BY JAMES TYSON, M.D.

Read February 9, 1898.

IN addition to the more usual duties assigned to a president, this officer, in the case of the Philadelphia County Medical Society, is expected "to give an address at the close of his term." No mention is made of the subject-matter or scope of such an address, and these matters are presumably left to the choice of the retiring officer. To review the work and chief events in the history of the Society during the year of incumbency, to suggest measures for its further development and for enhancing its usefulness to its members and to the community, are legitimate subjects of such an address, and have been treated by most of my predecessors. I propose, in a very short address, to follow their example.

First in importance is, perhaps, the literary work of the Society—what it has accomplished through papers prepared by its members for their mutual advantage. It is impossible in the time permitted, nor would it be interesting, to analyze, with a view of estimating its precise value, each of the 58 papers read in the course of our 20 scientific meetings. It would, perhaps, be invidious also to mention any individual papers, but I am quite sure that no fair reviewer will say of the forthcoming volume of Proceedings what I read in a recent notice of a book of like scope, "the volume can only be of importance to the members of the society and their friends." Of the 58 papers, 25 dealt with medical subjects, 16 with surgical, 8 with the eye, 4 with the nose and throat, and 1 was the address of the retiring president, Dr. James C. Wilson. It can be said of no one of these papers that it were better not written, while most are profitable reading.

In this connection, I cannot forbear allu-

sion to the satisfactory manner in which our Proceedings have been published during the past year by the publishers of the *Medical and Surgical Reporter*, under the editorial management of Dr. Kynett. The papers, with the discussions following their reading, appeared with great promptness in the succeeding issues of the journal. They are printed in large, clear type, and, when bound, will make a volume of 275 or more pages, about 25 pages more than the previous volume (XVII) contained. This has been accomplished with so little expense to the Society, that, for the first time in many years, the treasurer informs me, we close the year truly without any debt. It would, however, have been quite impossible to publish our Proceedings with such promptness, without the painstaking and energetic co-operation of the chairman of the Publication Committee, Dr. Eshner, who never failed to have the papers and discussions in the hands of the printer in good season. To the efficient chairman of the Directors, Dr. Beates, we are also indebted for careful supervision of the matter presented for our consideration.

There seems to be no reason why the arrangement for the forthcoming year with the publishers of *The Polyclinic* should not work as satisfactorily, but to me the ideal plan of publication for a society is to make up its own volume at the end of the year, leaving the authors to seek such media for immediate publication as they may themselves prefer. I do not, however, include in such media the lay-press. The standard, by which the acts of a physician are judged is a peculiarly high one, so high that the average layman cannot understand it. To him, medical etiquette is an absurdity,

and our objection to the ordinary modes of advertising he regards as unpractical. Yet, this standard is the natural outgrowth of the physician's occupation. Succor to the suffering, mercy to the unfortunate, priest-like fidelity to confidences reposed, are practices which tend to shape out a lofty ideal, and to such an ideal commercial methods are foreign. The adage, "business is business," which has always grated harshly on my ears in any application, is especially foreign to our ideal. The publication of medical papers in the lay-journals where they are likely to attract the attention of lay-readers to the physician-author, constitutes, in my judgment, commercial method. On the other hand, let us not pretend that we are better than we are. Do not let us claim that we publish our papers in the professional journals on purely philanthropic grounds, or only because we have a piece of valuable information that we desire to impart to our professional friends. We publish also to enhance our own reputation, a perfectly justifiable procedure, when accomplished through the medium of professional journals. I make this allusion because there have been one or two instances, in the past year's history, in which the authors of papers read before us, seem to have overlooked the requirements of the higher ideal.

Quite worth mention is the part taken by our Society in the semi-centennial meeting of the American Medical Association held at Philadelphia, in June last, an event which was signal in the history of that Association, being by general acknowledgment the most successful of all its meetings. The reception given by this Society at the Hotel Walton was by no means the least important of the social functions which went to make up that success. Although one of three social events provided at the same hour, it appeared as though one and all sought to honor our reception. It was an equally flattering acknowledgment of the importance of the society that his Excellency the Governor of the Commonwealth, the Hon. Daniel H. Hastings, was present during much of the time and welcomed personally very many of our guests. A large number of the scientific papers read before the various sections were by members of the Philadelphia County Society.

The Society has been true to its duties to the community in keeping track of matters

concerning the public weal. This was especially displayed in our successful protest against the location of the Municipal Hospital in the unhealthy marsh on the banks of the Delaware and in the appointment of a committee to wait on the Mayor of the City and Councils with a view to urging prompt action for the betterment of the water supply of Philadelphia.

In the course of the year 51 new members were elected, and at the January meeting 10 were elected who were proposed and recommended by the Censors during 1897. The number of resignations was 6, while death struck 8 from our rolls, including William H. Pancoast, Samuel N. Troth, Peter D. Keyser, Wm. A. Carey, A. E. Stocker, George W. Vogler, Harrison Allen, and J. E. Whiteside. The total number of members at the end of the year 1897 was 699. Thus our Society has become a very large body and should be, if it is not already, the most influential medical organization in the State.

It is not an easy matter to suggest methods of improvement to a Society which is already tolerably successful in the accomplishment of its objects. But in casting about for shortcomings I note first that the attendance at our meetings, though fair, is not sufficient. The average attendance during the past year was 53, the maximum being 86, the minimum 17. This when compared with the total membership is altogether too small. The question naturally arises why is it? I believe no single reason can be assigned. First, a large number of our members belong to other societies. To attend all meetings when one belongs to several societies is a severe tax, would be hardly profitable, and is therefore not to be expected.

Another reason for diminished attendance exists in the straight and broad path which leads to membership. It is held by many that County Societies are folds of moral influence and protection which should be open wide not only to any who desire to enter but also to all who can be induced to enter. I will not question the propriety of this, but it must be admitted that a certain number of indifferent members are thus obtained who often do not care for the meetings. A certain number also join for the sake of the privileges gained in connection with membership in the State and National Associations, who are similarly indifferent. The secret of a good attendance is either a profitable



meeting or a pride in the society and not the making a mere convenience out of it. Yet I am confident that if the indifferent members could be induced in any way to come they would find profit in it and our attendance would grow. There is plenty for our Directors to do in the way of rendering our meetings attractive, even though it may be no longer necessary to ask the members for papers. In a society made up of physicians, surgeons, general practitioners and specialists it cannot be expected that each one should be interested in every paper. I take it for granted that each of us not called by official duty to the meetings, first looks over the list of papers offered in the notice sent out, and if he finds anything to interest him he will attend. If not he will stay away. Hence it should be the object of the Directors not simply to get papers, but papers on varied subjects, so that every one may find something to interest him. It is not impossible that if the more liberal course suggested in the matter of publication were carried out, a larger number of interesting papers would be offered us, as few men are indifferent to the circulation of the journal in which their productions appear.

I noted the other evening the resignation of a suburban member, a resignation on the ground that the member was unable to attend because of his residing at such a distance. This same gentleman had just been elected to the College of Physicians and at the very meeting succeeding that of the County Society at which his resignation was received he was present. This goes to show that fellowship in the College of Physicians is regarded by some as more desirable than membership in the Philadelphia County Society, and there are certain reasons why this may be; but there is no good reason why a member should resign the County Society in order that he may join the College. On the other hand he who resigns the County Society gives up certain rights and privileges which fellow-

ship in the College of Physicians can never give him and which he may at any time be anxious to resume.

An object of proper concern with several of my predecessors is the Mutual Aid Association of the Society, and in common with them I cannot understand the indifference which obtains with regard to it. Either we physicians are not conscious of the fact that many widows and children of members of our calling are suffering the gnawings of poverty, while even a few old medical men now living are in want, or we are a singularly hard-hearted set. The expenditure of a few dollars annually by each member at a time when he scarcely feels it will be the means of relieving the pangs of poverty in many, and in some who least expect it. The interesting details by Drs. A. F. Currier and Chas. F. Leale of the New York Society for the relief of Widows and Orphans of Medical Men must be fresh in the memories of many, although the audience on that evening was far too small and reflected the same indifference which the majority of our members show in other ways to the laudable purposes of this beneficent association. I sincerely trust that there may be at least one or two in the hearing of my voice, who will be influenced to become annual member, life member, or benefactor of the Association.

In concluding I desire to express my thorough appreciation of the consideration which has been shown me during my term of office. I confess I entered upon its duties with some misgivings, as I had never taken the time to train myself in the parliamentary knowledge which is much more likely to be called upon in a large society like this than in the smaller ones with which I have been officially associated. In no single instance has there been any demand for superior skill in this particular, and my evenings with you have all been thoroughly enjoyed as well as profitable. I bespeak for my successor all the courtesies and kindnesses which have been extended to me.

## A CASE OF CONGENITAL NUCLEAR CATARACT.

BY J. WINTER WAMSLEY, M.D.

Read February 23, 1898.

OPACITIES of the crystalline lens may occur during fetal development, or what seems more peculiar, opacities from no apparent cause may develop shortly after birth, in cases where the eye ball and its structures appeared at first to have been perfect. A case of this nature came under my observation in April, 1897.

Wm. K., a boy, 14 years of age; at birth no defect in sight was observed, but when about 6 years of age the parents noticed a change in the boy's actions and in the movements of his head. He looked sideways, or with his head turned. The family physician, who attended at the birth, was consulted and advised special attention. He also stated that he had noticed no defect in the eyes at the time of birth. The parents were the first to notice the change then developing. The patient was taken to a hospital, where operation was advised, and treatment given. No operation was done, probably from the parents' neglect. From that time little was done to relieve the defective vision, the boy not being able to read or distinguish objects.

His early schooling was necessarily neglected. He learned, as best he could, from hearing. Three years ago the boy was again taken to one of our eye dispensaries, and two operations were performed on the left eye within three weeks. The patient evidently neglected to stay and complete treatment; the cataracts still remained the same as prior to the operations; there had been no visible absorption of the lens.

The following notes were made when the patient first consulted me for treatment:—Horizontal nystagmus of about two mm., under ordinary conditions. The number of oscillations seemed to increase if the patient became nervous. No existing inflammation in either eye. Pupils reacted well to light,

and light perception and projection was excellent; vision of both eyes about the same; at a distance of one foot he could count fingers with difficulty. Homatropin was used to dilate the pupils. In the central and anterior portion of each lens was an opaque spot of about two mm.; the peripheral portion of the lens was perfectly clear, and both anterior capsules were transparent, excepting a small place in the left capsule, which had a cicatrix from the original needle operation. It is probable that a single needle operation had been done on both occasions. The opaque spot in the left eye was a little larger than that in the right eye, and also may have been caused by the operation. No portion of the lens matter had been absorbed as a result of the operations. The capsule had apparently healed quickly. The tear in the capsule was not large enough over the site of the opacity, which being harder than the clear cortical portion, the aqueous fluid had had less solvent action upon it. With the ophthalmoscope the red reflex was readily seen in both eyes when the pupils were dilated, but not so when the pupils were in their normal state of action. No distinct view of the retina or its blood-vessels could be seen.

The patient stated that he could see better at night than during the day, and also better in a subdued light than in an intense light or average daylight. This fact was due to the dilatation of the pupils, allowing the light to pass through the outer clear portion of the lens, thus enabling him to see his best. Under ordinary circumstances, when the pupils were contracted from light stimulus, the pupils closed around the central opacities and consequently let in a smaller amount of light, none going through the nuclear portion of the lens.

As well as could be ascertained, the family history was good, no specific, rheumatic, or nervous disorder had existed in any member of the family. The patient has been healthy from infancy.

In April I again advised operation, and on the 25th double discission was done. As a preliminary, mixed treatment was given one week previous to the operation; two days before it, a mydriatic composed of atropin sulfate, 2 grains to 1 fluidounce of water, was instilled into the left eye three times daily, and on the day prior to the operation the patient had a hot bath and a saline laxative.

Cocain, in 4 per cent. solution, was used for local anesthesia, the eye-lids were separated by an ophthalmostat, the pupils were well dilated and the eye-ball was held at the corneo-scleral margin by an assistant.

Double discission was performed, two needles being used and each needle passed in at opposite sides of the cornea. The points of the needles were made to meet in the center of the lens, and using the cornea as a fulcrum, the two handles of the needles were brought together. The lens was thus forced apart, splitting completely in half.

Care must be taken in doing a discission, not to use too much pressure on the needles, as it would likely force the lens from its delicate peripheral attachment and cause it to drop into the vitreous.

Immediately upon the lens being broken, the needles were withdrawn. The aqueous humor then came in contact with the free split edges of the lens. A small amount of aqueous fluid also escaped through the vent made by the needles. The conjunctival sac was then irrigated, atropin instilled and a slight pressure bandage applied. In a few hours the bandage was removed, and as a precautionary measure to prevent any undue inflammatory action that might arise from the operation, cold compresses were used one hour at a time in every three hours. The atropin was continued, it being used every six hours for the first forty-eight hours.

Twenty-four hours after the operation the cloudiness developing in the lens showed that the aqueous was taking effect on the lens substance. A little pericorneal injection followed and did not pass off entirely until the greater portion of the lens had been absorbed, nearly four months after.

After the first few days ice compresses

were discontinued, but the instillations of atropin were continued twice a day for over four months; no disagreeable effect was experienced from their continued use, such as dryness of the throat and irritation of the conjunctiva, which often occur from long and continued use of this drug; no pain was present at any time, only a little soreness within the few hours after the operation.

The patient was seen about once a week. A few days after the operation, when the danger of any complication was thought to be well over, the patient was instructed to wear dark glasses and permitted to go out.

About two months later, while absorption was going on, the nucleus or the central opaque spot separated from the larger remaining portion of the lens, and dropping forward into the anterior chamber, lay in the bottom and in front of the iris. It caused no irritation and remained until the whole of the lens had been absorbed. Its slower solution was probably due to a calcareous or fibrous state.

Nearly six months was required to dissolve the lens in its entirety. No extra needling was necessary, as the lens was well softened and absorption was going on as fast as nature would permit.

On the 14th of October the posterior capsule was cut with Hunter's knife needle. The capsule was opaque and tough. Apparently it had acquired this state from the original operation of splitting the lens and also from the swelling lens substance. The knife needle was passed in through the lower and outer quadrant of the cornea and the capsule thoroughly divided longitudinally with a sawing or cutting motion. Care was taken not to use too much traction on the capsule or cause undue drawing upon the ciliary bodies—neglect of this endangers the good results of capsulotomies.

A pressure bandage was again applied, for one day, and on two or three occasions, during that time, was removed for instillations of atropin. The following day both the bandage and atropin were discontinued. No reactions whatever followed the capsulotomy. Examination of the fundus about three days after the operation showed the pupil still dilated. Time was allowed for the effects of the mydriatic to pass off and the pupil to regain its action, before the glass was prescribed.

The opening thus made in the capsule

allowed the light to pass through to the fundus to the fovea centralis which had been long in disuse. After the capsulotomy, the fundus was examined with the ophthalmoscope; the retina, nerve, blood-vessels, and vitreous were perfectly normal, no trace whatever remaining of a fibro-vascular sheath to the lens. The patient was refracted by retinoscopy, a plus 13 diopter glass being used. As soon as the glass was put on, the patient was able to count fingers at two yards with accuracy, and also by looking directly at the object. Whereas before, the patient had to look sideways in order to get the best view possible, the light coming through the peripheral portion of the lens.

The vision at the present time is 20-150. This amount of vision is far from normal and better vision might be expected after all difficulties had been removed. The deficiency is readily explained, by an amblyopic condition of the retina due to disuse. The patient was given glasses in the early part of November last and since that time has been wearing them constantly with continued improvement, the rays of light falling directly on the fovea. The nystagmus has greatly lessened in the number of oscillations of the eye-ball, and a more pleasant and intelligent expression has developed. The remaining cataract in the right eye has not yet been operated upon, but operation

will be begun in the near future. While the patient has gained distinct and direct vision from the operations, he will not be able to judge distance until he has the conjoint use of both eyes.

The question arises as to the causes of the lenticular opacities in these peculiar cases. With the best possible history of the case from infancy, no indication whatever could be found that could, in reason, be the apparent cause of the cataracts. There had been no fetal iritis, or if it had occurred, it has left no trace of the disease on the margin of the iris, nor any mark on the anterior capsule over the site of the opacity. It seems to me that there might have been a tissue change from some condition of the lenticular nerve fibers, which in turn caused a degeneration of certain lens fibers. This is the only apparent cause. I see no reason why such a process could not cause such change in the lens of the eye, in the same way as it is often found in other tissues and portions of the body.

These cases of congenital cataract give excellent results following operation, providing all the other structures of the eye-ball are normal. The sooner the operation is done the better will be the result in gaining acute vision, by a stimulation and development of the central retinal cells and the wearing of proper glasses.

## DISCUSSION.

DR. EDWARD JACKSON said that this case is of special interest because of the condition in which the lens was found long after a needle operation, of which little or no effect was visible. A few years ago, in conjunction with Dr. Schneidemann, Dr. Jackson reported a series of cases in which the lens after injury had more or less completely recovered from opacity. Perhaps that is what occurred in this case. In that series was one eye in which the needle was passed entirely through the lens, and the track visible after operation entirely healed and cleared up. Sub-

sequently freer opening of the capsule produced absorption of the lens. It is not usually realized that the lens can thus recover from injuries. In the lower animals there is often difficulty in experimentally producing cataract, because the puncture heals and the lens becomes transparent again. There are comparatively few cases on record such as Dr. Wamsley has brought before us this evening where the human crystalline lens was unaffected so long after puncture.

THE POSSIBILITY OF MODIFYING THE CONTAGIOUS DISEASES ACT  
SO FAR AS IT CONCERNS DIPHTHERIA WITHOUT  
LESSENING ITS PROTECTIVE POWER.

BY HERMAN B. ALLYN, M.D.

Read February 23, 1898.

As all the members of this Society are well aware, an act to provide for the more effectual protection of the public health in the several municipalities of the Commonwealth of Pennsylvania was passed by the Legislature and approved by Governor Hastings on June 18, 1895. This act requires physicians to report to the health authorities certain contagious diseases, says that houses in which such diseases occur may be placarded, requires the disinfection of the houses, and prohibits public funerals in fatal cases. Section 11 reads as follows:

"SECT. 11. No child or other person belonging to or residing with the family of any person, or residing in the same house in which any person may be located, who is suffering from cholera, small-pox (variola or varioloid), scarlet fever, typhus fever, yellow fever, relapsing fever, diphtheria, diphtheritic croup, membranous croup, or leprosy, shall be permitted to attend any public, private, parochial, Sunday or other school in said municipalities, and all school principals, Sunday-school superintendents, or other person in charge of such schools, are hereby required to exclude any and all such children and persons from said schools, *such exclusion to continue for a period of thirty days following the discharge, by recovery or death, of the person last afflicted in said house, or family, or his or her removal to hospital, and the thorough disinfection of the premises,* and all such children or other persons as aforesaid, before being permitted to attend or return to school, shall furnish to said principal or other person in charge of said schools a certificate signed by the medical attendant of said children or persons, or

by a physician to be designated by the health authorities of said municipalities, setting forth that the thirty days mentioned in this section have fully expired. *Provided, however,* That the health authorities may, by rule or regulation, provide that such certificates shall only be given by a person to be designated by said authorities, and in such case no other certificate shall be recognized."

This act, it will be noticed, excludes a child from school for thirty days after convalescence from diphtheria. It also excludes from school for thirty days any other child or person who may have been in the family or house at the time diphtheria developed; the beginning of the thirty days dating from the discharge by recovery or death of the person last afflicted in the house or family, or his or her removal to hospital and the thorough disinfection of the premises. It is to these provisions of the act that I wish to ask your attention to-night.

The act is a good one in the main, and in the interest of the public health. It is not my purpose to criticise it except in so far as diphtheria is concerned.

In a case of suspected diphtheria, or in the case of a person who has been exposed to diphtheria, the absence of Klebs-Löffler bacilli from the secretions of the throat and nose may be taken as proof positive that the person in question has not diphtheria, for diphtheria practically never occurs primarily in other structures. If this proposition be granted, and it seems to me unassailable, then it must be admitted that we are able, by cultures from the throat and nose, to say, not only when a person who has been affected with diphtheria is convalescent and

has ceased to be a source of danger to other persons, but also whether or not any persons who have been in contact with the diphtheria patient are free from diphtheria either actually or potentially or not.

These statements have a direct bearing upon that portion of the Contagious Diseases Act already quoted. The act declares that a child ill with diphtheria shall be excluded from school "for thirty days following the discharge by recovery or death of the person last afflicted in said house or family." The same exclusion applies to other school children or teachers who may be in the house or family. Moreover, if the person affected with diphtheria is sent to the Municipal Hospital, those who were in the house or family at the time he was taken sick, are under the thirty-days' ban, just as though the patient had remained at home. So, too, are any who may have at once removed to another house when the case of diphtheria developed.

Now, in the light of modern bacteriologic methods of examining the secretions of the throat and nose, it seems to me clear that the present State law, so far as diphtheria is concerned, can be made less stringent without incurring increased risk of transmitting the disease from the sick to the well.

In the first place, if cultures from the throat and nose of a person who has had diphtheria no longer contain Klebs-Löffler bacilli, I should say such person was no longer a source of danger to any one, and that he should *at once*, not thirty days thereafter, be allowed the same privileges, so far as school and the public are concerned, as a well person. But the practice of the Board of Health in culture cases has been to date the beginning of the thirty days from the culture which showed absence of diphtheria bacilli.

Again, if the diphtheria patient has been removed to hospital, and those who have been left in the house or family are proved, by bacteriologic examinations of the throat and nose, to be free from diphtheria bacilli, the ban should be removed from them as soon as the house has been satisfactorily disinfected.

The same rule should apply to persons who were in the so-called infected house when diphtheria appeared, but who removed and who can be proved free from diphtheria bacilli.

I am aware that, in the last case, our city

health authorities have sometimes sanctioned return to school in two weeks instead of 30 days, but I contend that if persons are free from diphtheria bacilli, they can at once, with safety to others, be admitted to school; indeed, they would be safer to associate with then than two weeks or thirty days later, in which interval they might become infected from a new source. Of course, the bacteriologic examinations should, in all such cases, be conducted by the Laboratory of Hygiene of the Board of Health, from cultures submitted by the attending physician.

It must be remembered that our knowledge of diphtheria has increased since the Contagious Diseases Act was passed by the State Legislature, and that our city health authorities act by virtue of the authority given in this act. The writer has no disposition to criticise them, but simply to point out that present bacteriologic methods make the thirty-day ban unnecessary. At the same time, it should be known that Section 19 of the Act empowers them to alter or amend the rules and regulations of the Act, and says: "Such rules and regulations shall have the same force and effect as though embodied in this Act." It would appear from this that the Philadelphia Board of Health could, without appeal to the Legislature, modify the existing law. But, last December, I wrote to the Board, citing the facts contained in this paper, and suggesting that the Board request the next session of the Legislature to modify the existing law, so far as diphtheria is concerned. No reply of any kind was received.

There is another aspect to this question of making the law less burdensome which is of great importance. Diphtheria is spread, for the most part, by the mild and unrecognized cases. How many of these cases there are, some regarded and treated as tonsillitis, some as simple sore throat, and many others receiving no treatment except domestic remedies because the child does not appear ill enough to require the services of a physician—no one can tell. But it is certain that many of these cases, perhaps all, could be detected by proper culture methods, and equally certain that many more would be subjected to the culture test if the present law were not regarded by all—laymen, physicians and medical inspectors—as unnecessarily burdensome; for a law which works needless hardship to patient and family alike, places a premium on deception and

evasion. I do not believe that any reputable physician would fail to report a case of diphtheria, but he is not disposed to subject every non-membranous throat affection to a culture test, and thus cases of diphtheria not exhibiting membrane, or mild cases resembling tonsillitis, escape unrecognized. I am convinced that diphtheria will never be materially checked in its spread until the mild cases are recognized and isolated; and I am equally convinced that bacteriologic examination is the only method by which these cases can be detected. Some years ago I was vain enough to think that I could distinguish with certainty diphtheria from follicular tonsillitis and both from catarrhal pharyngitis. Later and wider experience has shown this to be impossible. I do not believe it is possible for any clinician *always* to tell these diseases apart. Very recently I met with the following case which illustrates this point admirably: a child of four was taken sick and complained of its throat. An examination showed chronically enlarged tonsils, in the crypt of one of which was a yellowish creamy exudate about a line in width and half an inch long. The other tonsil and fauces and nose were free from discharge or exudate. As the child had had follicular tonsillitis a number of times before, I regarded the case as a mild follicular tonsillitis in the early stage. But in order to guard against a mistake a culture was made. This showed the presence of diphtheria bacilli. In the meantime even the slight exudate I have mentioned disappeared; thinking, or rather hoping, that the bacteriologist had made a mistake I at once made another culture. This also showed diphtheria bacilli; and the child also diphtheritic toxemia—vomiting, absolute anorexia, albuminuria, great prostration, and a very feeble, irregular heart with a musical murmur. There was never any membrane in this throat, but if diphtheria had not been recognized early by culture method it is very probable that sudden death would have occurred from cardiac paralysis.

In still another case I found a grayish white adherent exudate on fauces and tonsils, and confidently reported the case as diphtheria. Repeated examinations by culture, however, failed to show any diphtheria bacilli, and the case proved to be one of ulceration of tonsils and fauces, the ulcers being covered with the same grayish film one sees in ordinary cankers of the mouth.

The points to which I wish to direct special attention are the following:

First, a culture upon blood serum followed by a microscopic study of the growth upon the serum is the only certain method of determining the presence or absence of diphtheria in a given case.

Second, unless this culture method is generally adopted in all doubtful cases it will be impossible to detect mild cases and so limit the spread of the disease.

Third, the mild cases are more likely to spread the disease than the severe cases.

Fourth, physicians will be loth to employ the culture method generally unless the Board of Health consents to accord school privileges to children and others as soon as a bacteriologic examination fails to show the presence of Klebs-Löffler bacilli, and not, as at present is their practice, thirty days thereafter.

In conclusion, I wish to offer the following resolution:

*Resolved*, That the Philadelphia County Medical Society request the Board of Health of Philadelphia to modify the Contagious-Diseases Act so far as it affects diphtheria in such a manner that persons who have had diphtheria or who have been exposed to diphtheria, but whose throats by culture methods no longer show the presence of diphtheria bacilli, may be permitted at once to resume without further restriction their ordinary duties; *provided that* the infected house or premises have been disinfected, and that the cultures have been made by the attending physician and examined by the Laboratory of Hygiene of the Philadelphia Board of Health.

## DISCUSSION.

DR. T. J. MAYS agreed with Dr. Allyn that it certainly was a great inconvenience to parents and children that the latter be debarred from school for thirty days from the time bacilli disappear from their secretions. He was heartily in sympathy with any measure that would ameliorate this condition.

DR. HERMAN B. ALLYN expressed the hope that the point that he wished to make was clearly understood. It was this: That from the time a culture shows absence of

diphtheria bacilli the thirty-day rule was enforced. In other words, the Board of Health regards the patient as well thirty days after he is actually well. This was a very good rule before bacteriologic examination was made, but now that such examinations are made, he thought this irksome rule should be relaxed and that patients recovered from diphtheria should be accorded the privileges of other persons so soon as bacteriologic examination of their throats and noses showed absence of bacilli.



## AN INSTANCE OF SUDDEN DEATH DURING LABOR, FROM CHRONIC ADHESIVE PERICARDITIS.

BY W. REYNOLDS WILSON, M.D.

Read February 23, 1898.

MRS. M. R. B., colored, aged 39 years, pregnant for the third time, fell in labor late in the evening of June 19, 1895. She presented, as to her previous history and subjective symptoms, no record of prolonged or chronic illnesses, with the exception of an obscure syphilitic taint, probably contracted after marriage.

Her first delivery occurred twelve years ago; the child is still living. Her second delivery occurred ten years ago; this child succumbed in infancy to marasmus complicated, in all probability, by hereditary syphilis. Her former labors were rapid and comparatively easy.

The general condition of the parturient was that of a well-developed, hard-working woman, complaining of frequent neuralgic headache as her only symptom.

Special examination revealed, by palpation, a normal uterine tumor with the head presenting, but not engaged; by auscultation, the fetal heart transmitted toward the left; by digital examination, obliteration of the cervix and beginning dilatation. The promontory was within reach, denoting a moderate degree of pelvic contraction, probably rachitic.

The first stage of labor was normal, the pains recurring at frequent intervals, the patient being able to be about. The duration of the first stage was eight hours, full dilatation of the cervix with rupture of the membranes occurring at 5.30 on the morning of June 20th. During the second stage, the pains recurred every three minutes with unusually strong expulsive effort. Vomiting was present, but with no symptoms of exhaustion. Two hours from the beginning of the second stage, the head having engaged

with difficulty, the patient showed suddenly signs of syncope; the skin was moist, and the pulse became rapidly imperceptible. Slight twitching of the mouth was present, also failure of respiration. The heart-sounds became rapidly inaudible, and the patient died within ten minutes of the appearance of the fatal symptoms.

Owing to the circumstances of the case, that is, the absence of any symptoms of cardiac lesion preceding labor, and with the history of former normal labors, together with the fact that I had taken charge of the case only shortly before the time of confinement, I was not prepared for the emergency which occurred. On the first appearance of symptoms of syncope, I sent for forceps.

Under the administration of ether, the patient revived for a moment. The fetal heart-sounds were then inaudible. On hasty examination, I thought it best to attempt the application of forceps. It was too late, however, and on consultation with Dr. E. P. Bernardy, who had kindly responded to my call for assistance, the thought of *post-mortem* Cesarean section was given up, on account of the absence of pulsation in the cord, the latter having been found prolapsed and pulseless on the attempt to apply the forceps. The woman was, therefore, practically moribund from the first sign of cardiac exhaustion. She, unfortunately, died undelivered.

On post-mortem examination (four hours after death) the following condition was noted: The body of a well-nourished woman in beginning rigor mortis.

THE ABDOMEN contained a moderate amount of serum. The intestines were pale, partially distended with gas and displaced by the pregnant uterus. There were no

signs, from the contents of the abdominal cavity, of rupture of the uterus; although there had occurred a profuse discharge of venous blood upon introduction of the hand into the uterus at the time of the forceps application. This was due probably to the detachment of the placenta. The liver was normal in appearance and displaced upward by the pressure of the uterine tumor.

**THE KIDNEYS.**—The right kidney was lobular and slightly contracted, showing an adherent capsule. It was flattened by the uterine pressure. The left kidney was apparently fatty, although both organs showed contraction of the cortex and enlargement of blood-vessels.

**THORAX.**—On opening the thoracic cavity the right pleural sac showed general adhesions firmly organized, the thickened membrane being continuous anteriorly with the thickened pericardium. The lung showed no special changes beyond those connected with the pleural thickening. The heart was bound down by the densely attached pericardium, the latter being generally and markedly adherent. Both ventricles were contracted and contained dark liquid blood. The left ventricle was hypertrophied, the wall being from three-quarters of an inch to one inch in thickness. The right ventricle was extremely thin-walled, so that the effort to detach it from the adherent pericardium caused a rupture of the wall. The aorta was mildly atheromatous.

**THE UTERUS** contained the full term fetus in the first position with the presenting head in beginning engagement. The amniotic liquid was drained away and the surface of the child was stained with meconium. The placenta showed degenerative changes.

There is no note of valvular lesions in connection with the heart nor of the occurrence of pulmonary embolism.

The lesion described above is a rare condition occurring as a complication of pregnancy, the more common forms of heart disease being represented in the following order of frequency, according to Winckel: Insufficiency of the mitral valve, insufficiency of the tricuspid, aortic stenosis and insufficiency being comparatively rare. The lesions of the heart-muscle secondary to valvular disease are confined to hypertrophy with or without dilatation. Independently there may occur degenerative changes together with acute myocarditis.

Physiologically a temporary eccentric hypertrophy exists (Jaggard), the result of an augmentation in the total blood mass, the intervention of the placental circulation and the increased intra-abdominal pressure, all requiring additional propulsive effort on the part of the heart. In the present case we have a combination of these physiologic conditions, augmented by an hypertrophy due to adhesion between the surfaces of the pericardium, anchoring the heart and hampering its movement, and by the weakening of the heart musculature from the chronic interstitial myocarditis secondary to the pericarditis. The cause of the myocardial change is to be found, according to DaCosta, in such cases, in the interference with the nutrition of the heart-wall on account of the density of adhesions.

As to the occurrence and cause of death, it is plain that the patient died from a suddenly developing paralysis of the heart from overstrain. From the appearance of the heart-wall, the energy of the heart had been taxed to the full, even preceding labor. In fact, we may consider that the point of endurance had been reached in all probability as the pregnancy progressed. This seems evident when we take into account the increased work which had been imposed upon the heart by the existing condition, which had necessitated an additional degree of hypertrophy upon a muscle that had already become overstrained through chronic pericarditis. The symptoms in the case, as well as the lesions discovered post-mortem, preclude the possibility of our entertaining the existence of the causes more commonly noted in death sub partu from heart disease, namely, (in the order of frequency of occurrence) sudden pulmonary edema, rupture of the heart-muscle (from degenerative process, whether of a fatty nature or of acutely inflammatory myocardial change), and rupture of the aorta from increased blood pressure caused by violent abdominal contractions.

As to the progress of labor complicated by heart lesions generally considered, we may note that if we place heart disease among the chronic affections which may complicate labor, the general rule holds good, namely, that the expulsive power inherent in the parturient woman is but little affected in such diseases; labor progressing without interruption and usually with comparative rapidity in the second stage. Winckel's

statistics show 63 per cent. of normal labors in heart disease. This statement does not cover the pathologic conditions that may arise prior to labor, or the event of sudden death during labor. As to the first, the gravida presents, first, the liability to abortion or miscarriage (although the danger of this is not extreme). Secondly, the risk consequent to the increased abdominal pressure and pulmonary stasis. As to the second, the danger of sudden death from the causes noted above is to be considered.

The event of labor, however, is rarely interrupted, either by the preceding condition of the woman or by this suddenly-developing danger. In the case reported, the accidental death might have occurred from any other condition of strain. The heart in this instance was more liable to paralysis from the unusual character of its lesions, rather than from the existence of the heart affection; the degenerative condition being accompanied by the impairment of heart-motion due to the adhesions, as well as by the condition of hypertrophy.

It has been the experience of the writer to observe, not only absence of grave danger in labor complicated by heart disease, but also to find that such labor is followed by a favorable condition in the puerperium. This is probably due to two causes: first, to the fact of mitral lesions existing more com-

monly than aortic (when the latter exist, the gravity of the outlook corresponds to that in uncomplicated aortic disease); and, secondly, to the fact that, although heart affections in parturient women are apt to develop after the first pregnancy, the comparatively early stage of mature life corresponding to the period of sexual activity, brings the child-bearing period within the stage of unexhausted compensation.

The instances of sudden death due to thrombosis should not be considered in this connection, as they belong to conditions dependent upon septic infection.

As to the treatment of the case under consideration, it is difficult to say what might have relieved the patient had the diagnosis been established. If the condition had been detected early in pregnancy, we might have selected a favorable time to induce labor. If the patient had proceeded to labor and the condition was then discovered, the free use of chloroform with gradual dilatation of the cervix would have helped her. The condition of the patient's kidneys, however, and the contraction of the pelvis, would have had a tendency to favor shock should we have attempted artificial delivery even by means of the forceps. The age of the patient, and the fact of the condition of her heart being chronic, must also be considered.

## DISCUSSION.

DR. L. J. HAMMOND said that this subject was one of great importance from a surgical standpoint, in view of the methods of the present day in treating recurrent pericardial effusions by injection of irritants, such as iodine, carbolic acid, etc. The surgeon, therefore, has not looked upon pericardial adhesion in so serious a light as the case just reported would show it to deserve under certain conditions. Many cases have been reported by American and European observers in which cure of serous pericardial effusion was sought by producing pericardial adhesion, and this case should certainly

illustrate the importance of caution where serous effusion is met with in child-bearing women. Dr. Hammond asked Dr. Wilson to what extent adhesion had taken place in his case.

DR. W. REYNOLDS WILSON replied that the adhesions were complete. In attempting to remove the pericardium, post-mortem, it caused a rupture in the right ventricle. Dr. Wilson never saw such an adherent condition before. At Blockley he had seen grave adhesion, but never such complete adhesion as in this case.

## ON THE PREDISPOSITION TO ACUTE PNEUMONIA, WITH REMARKS ON THE VALUE OF COLD LOCALLY APPLIED IN ITS TREATMENT.

BY THOMAS J. MAYS, A.M., M.D.

Read February 23, 1898.

WHATEVER else may be true of acute pneumonia it is certain that there are some points in the predisposition to this disease which are not altogether clear. It goes without saying that alcoholics, or diabetics, or persons who follow certain injurious employments, or those who are constitutionally weak, are especially prone to it. Yet, on the other hand, this disease seems to attack many who are apparently in the best of health. The question then is, does acute pneumonia attack only those who are constitutionally weak and exhausted, or are none immune to it, no matter how healthy and strong they may be?

Medical opinion is divided on this point. Hippocrates taught that pneumonia was specially prevalent among the robust and healthy, an opinion which was strongly shared by Grisolle. This has been opposed by Bennett, Juergensen, Von Ziemssen and others. In connection with this question, and in order to get at its truth more clearly, it occurred to me that the experience of a life insurance company in regard to the fatality of pneumonia among its policy-holders would serve to throw some light on it. Here is a selected class of persons that are presumably in good health when insurance is effected, and if the normal state provides immunity from pneumonia then this disease should not occur as frequently directly after insurance is effected as some years later, when the state of health may have become impaired. In accordance with this idea I wrote to Dr. A. B. Bisbee, the Medical Director of the National Life Insurance Company, of Montpelier, Vermont. He very kindly furnished me with the following interesting experience of that company in

regard to pneumonia, for a period of 47 years—from 1850 to 1897. I desire to return him my warmest thanks for his prompt and generous response to my appeal.

During that period the total number of deaths from all causes amounted to 2,502, of which 206, or 8.23 per cent. were produced by acute pneumonia. The deaths from pneumonia (206 in number) are here given in the tabular form of groups which show the number of deaths in each year, together with the degree of family and personal predisposition to pulmonary disease. All the deaths which occurred from pneumonia during the first year after insurance was effected constitute group one, and so on for the first seventeen years, after which the deaths occurring during each decennium constitute a group, of which there are three. Each group gives the length of time of insurance before death; the number of deaths in each group; the percentage of deaths in each; the number of these deaths in which a family predisposition to pulmonary disease existed; the degree of family predisposition, which is based on a percentage-ratio between the number of cases with a family predisposition and the whole number in the group; the number of deaths in which a personal history of pulmonary disease existed; and the degree of personal predisposition, which is based on a similar ratio to that which obtains in the case of the degree of family predisposition. The family predisposition to pulmonary disease is measured by the history of pulmonary phthisis, pneumonia, asthma, etc., occurring among the parents, brothers, sisters, and grandparents of the members in each group.

Now these 206 lives were selected from the general population of adults on account

Year in which death occurred after insurance.	No. of deaths in the year.	Percentage of deaths in the year.	No. of these deaths in which family history of pulmonary disease existed.	Percentage ratio of family predisposition.	No. of these deaths in which a personal history of pulmonary disease existed.	Percentage ratio of personal history.
First . . . . .	31	15.04	9	23.08	3	9.67
Second . . . . .	14	6.79	3	21.42	1	7.13
Third . . . . .	24	11.65	9	37.5	3	12.5
Fourth . . . . .	6	2.91	2	33.33	0	0.
Fifth . . . . .	11	5.33	2	18.18	1	9.09
Sixth . . . . .	7	3.39	3	42.85	1	14.14
Seventh . . . . .	9	4.36	1	11.11	1	11.11
Eighth . . . . .	5	2.42	2	25.00	0	0.
Ninth . . . . .	9	4.37	0	0.	0	0.
Tenth . . . . .	11	5.34	5	45.45	1	9.99
Eleventh . . . . .	3	1.45	0	0.	0	0.
Twelfth . . . . .	3	1.45	2	66.66	0	0.
Thirteenth . . . . .	5	2.42	1	.48	0	0.
Fourteenth . . . . .	3	1.45	0	0.	0	0.
Fifteenth . . . . .	5	2.42	2	40.00	0	0.
Sixteenth . . . . .	5	2.42	1	20.00	1	20.00
Seventeenth . . . . .	3	1.45	1	33.33	0	0.
From 18th to 27th year	22	{ 10.68 ave. 1.06 }	5	22.72	3	13.63
From 28th to 37th year	19	{ 9.22 ave. .92 }	4	21.00	3	15.7
From 38th to 47th year	11	{ 5.34 ave. .53 }	3	27.27	0	0.

of their superior health, and it is a question of great interest whether their excellence in this respect gave them any special protection against acute pneumonia? If this is the case the smallest mortality rate from this disease would naturally prevail, at least during the early part of the insurance period rather than later; but it appears from the above statistics that its death-rate was higher in the first than in any succeeding year—it being 15.04 per cent. of the total pneumonia mortality during this period. Again for the first three years the average death-rate was 11.16 per cent., while the average death for the three last separate years on the table (15th, 16th and 17th) is 2.10 per cent. And again the average death-rate for the first five years was 8.34 per cent.; while for the second five years it was but 3.98 per cent. Viewing the question of liability from any standpoint we may, in this table, we find no evidence that a superior degree of personal health affords the least immunity from an attack of acute pneumonia.

In the second place, did a family history of pulmonary disease exert any special influence in bringing on pneumonia in these cases? It seems not, for the period during which the most marked family history prevailed, hardly corresponds with that of the

greatest pneumonia mortality. Then the largest number of deaths occurred during the first, second, and third years after insurance, while the burden of a family history was not as heavy then as it was during the last three years given in the table. It will also be seen that there is the same lack of correspondence between the family history of pneumonia and the highest mortality from this disease. From these data we may conclude, therefore, that health and vigor do not only not give security against an attack of acute pneumonia, but, in accordance with the teachings of Hippocrates and Grisolle, seem to entail a special liability to this disease.

There is another point which is germane to the subject under discussion, and that is the value of statistics in determining therapeutic results. There is much said about the perfidy and craftiness of statistics when they are applied to practical medicine, and there is no doubt that when abused they are bound to lead to error and confusion, but with all their shortcomings in this respect and with all the vituperation and malevolence that have been hurled against them, I believe that when legitimately employed they are an indispensable aid to the success of the healing art. Indeed I aver that the simplest procedure in practical therapeutics

is so intimately bound into the warp and woof of the science of figures that without the latter the former is an impossibility, and that the physician who professes to regard the importance of statistics in the determination of practical results with distrust is either unconsciously deceiving himself, or fails to grasp the fulness of their meaning. Does he give Epsom salt blindly, or does he give it with the certainty and assurance, founded on figures, that it had already produced certain cathartic effects in one or in a number of cases either in his own or in the experience of others under circumstances similar to those in which he is giving it now? Is not the same true of the administration of digitalis in cardiac disease, of quinin in ague, of strychnin in shock, and of every other agent in our therapeutic armamentarium? It is true that not every case of heart disease, or of ague, or of shock, is cured with these drugs, but statistics vitalize the fact that they give better practical results in such conditions than other agents, and for this reason they are adjudged so valuable. I do not for a single moment mean to decry the importance of experiment in developing drug-action, for by doing this I would only prove myself inconstant to much of my own life-work. But even *its* value is largely decided by figures, for of what significance is a single experimental result? Standing by itself of very little, it is only by repeating the same experiment again and by comparing its products again and again that an approach to a certainty in the action of any drug is attained, and even this has to be refined and trituated in the crucible of clinical experience before its therapeutic status is definitely settled.

Now, what of the application of figures in determining the value of cold in the treatment of acute pneumonia? Is there, in this disease, such a constant likeness or similarity of pathologic conditions as are demanded by an experiment of this kind, and on which a given remedy may or may not act? I think there is, for whatever we may say of the potency of incidental influences like age, personal idiosyncrasy, complications, environment, season, infection, alcoholism, syphilis, malaria, rheumatism, etc., the primary, visible pathology of pneumonia is always the same, viz., engorgement of the pulmonary capillaries. In making this statement, I fully recognize the distinction which is

usually drawn between croupous and catarrhal pneumonia; that the deposit in one is chiefly fibrinous, and in the other principally catarrhal; that, in one, pleurisy is nearly always present, and in the other it is nearly always absent; and that they often exist, independent of each other; but I contend that, originally, they both largely, if not wholly, depend on the same pathologic principle, and that the differentiation, which arises subsequently, is chiefly due to a difference in the activity of the pneumonic processes.

It is, therefore, the engorgement and the distention of the pulmonary capillaries which constitute the common pathologic groundwork in pneumonia, and it is this ever-present factor that we seek to combat with our therapeutic forces. It does not matter whether we bleed the patient out of his veins by venesection, or whether we give aconite, veratrum viride, and tartar emetic, and thus bleed him in his own veins, or whether we apply cold, for all of these efforts tend to bring about the same result, viz., a diminution of the pulmonary blood supply.

Now of all the agents that have been employed in the treatment of pneumonia I believe that cold locally applied to the chest stands paramount to any other form of treatment in favorably influencing the engorged circulation in the pneumonic process. The *modus operandi* of which, so far as I understand it, has already been discussed in my previous papers on this subject, and I merely wish to refer here to the practical data—to the statistics—which seem to demonstrate the truth of this proposition.

Dr. Osler states that 20 per cent. of the cases of pneumonia died in the Montreal General Hospital, and in the Charity Hospital of New Orleans; of 1,000 cases of pneumonia treated in the Massachusetts General Hospital from 1822 to 1889, the death-rate was 25 per cent. According to Dr. Hartshorne the mortality-rate from this disease in the Pennsylvania Hospital during the years 1884, 1885 and 1886 was a little more than 31 per cent. Louis treated 107 cases, of which 32, or about 30 per cent., died. Grisolle had a mortality in 232 uncomplicated cases of about 25 per cent. Of 648 cases treated by Rasori with large doses of tartar emetic, about 22 per cent. died. From 1845 to 1861 Dr. Huss, of Stockholm, treated 2,616 cases, with a death-rate of

10.74 per cent. Dr. J. Hughes Bennett treated 129 cases of pneumonia in the Royal Infirmary of Edinburgh from 1848 to 1865 with only four deaths, or a mortality of 3.1 per cent.

Now so far as I am able to ascertain, most of the cases referred to, except those of Dr. Bennett, were treated in accordance with what is known as the antiphlogistic principle, *i. e.*, by bleeding, blistering etc., and by the internal administration of large doses of tartar emetic, with a mortality-rate varying from 10 to 30 per cent. Dr. Bennett obtained his very favorable results by a mixed treatment, *i. e.*, he bled occasionally, and internally gave ammonium acetate and small doses of tartar emetic (gr.  $\frac{1}{4}$ ) with spirit of nitrous ether, and wine of colchicum seeds. He emphasized the importance of nourishment, however, by giving an ample supply of milk, beef-tea, beefsteak, mutton-chops and eggs.

Now while Dr. Bennett's results are exceptionally good it must not be overlooked that they have never been repeated by any one, so far as I know, on the lines laid down by him. By this I do not mean even to intimate that they have been obtained accidentally, for I feel sure that much of what he recommends constitutes an essential part in the successful therapeutics of acute pneumonia, especially the occasional use of the lancet, the administration of salines and nutrients; yet, on comparing his results with those which in addition to other treatment have been obtained by the use of local cold, we find them inferior. Thus, Dr. Hegelé, head physician of the Würzburg Hospital, treated 40 cases with cold water during 1848 and 1849, without a single death. According to the *London Lancet*, August 10, 1889, p. 279, Dr. Fieandt, a Finnish physician, treated 106 cases of pneumonia with 3 deaths, or a mortality-rate of 2.82 per cent. The death-rate in the several collective investigations on cold in the treatment of acute pneumonia which I have made and reported to this Society is not quite so low—being 3.35 per cent. in 299 cases.

In conclusion I wish to refer to a few practical points which I believe to be essential in the successful application of cold to the chest in acute pneumonia.

(1) *Time and length of application.* Cold should be applied by means of ice in bags as early as possible, and be kept in contact

with the chest until the temperature comes to, or near the normal and remains there. The mere fact of its coming to the normal is not evidence that it is going to remain there. Very often the ice is removed too soon and the temperature goes up as high as it was before, and is more difficult to get down the second than the first time. The best results are, therefore, not obtained if we follow the idea that the ice is to be removed when the temperature is depressed to a certain point, and to be reapplied when it exceeds this limit. For besides its influence on the temperature, cold modifies the pathologic process in the lung, and therefore is best kept in place until the local excitement is subdued. A good indication as to when this point is reached is when the patient becomes chilly, and when the cold begins to feel uncomfortable to him.

(2) *Does injury follow the prolonged use of cold?* So far as I can tell, danger from this source, if proper judgment is exercised, need not be considered. So far as I know, this is the experience of every one who has used it.

(3) *Is the application of cold to the chest in acute pneumonia a form of hydrotherapy?* The impression prevails that cold thus applied belongs to the domain of hydrotherapy. It does not. Water has nothing to do with the procedure, except in so far as its solid form is used as a medium to convey cold to the chest. The idea that it is the water that plays the chief part often enforces the erroneous conclusion that cold tub baths or general spongings are as efficacious as the local application of ice to the chest. This I believe to be an error; for, beside the exhaustion, the dyspnea, and the strain on the heart which a tub bath entails on a pneumonic patient, it is far inferior to the simple and easy method of applying cold locally in the form of ice. It is cold thus applied, and not water, which is demanded by every physiologic consideration in the case. It is the low temperature that tones up and invigorates the nervous system, that contracts the dilated and tortuous pulmonary capillaries, that gives force and strength to the weakened heart, and that acts reflexly on the heat-centers and so reduces fever.

*Collateral Treatment.*—In addition to the local use of ice on the chest, it is important to apply one or two ice bags to the head; to administer strychnin in large doses, not less than  $\frac{1}{16}$  of a grain, every four hours, to

an adult; to give salines in the form of ammonium acetate and potassium acetate; and in case there is any active rheumatic manifestation, which often exists in a latent condition, to reinforce the action of the salines with the salicylates and colchicum. Morphin should be given to produce quiet and sleep, and quinin for its tonic effects. If a muttering delirium develops in connection with a dry, black, tremulous tongue, we should

give tincture of capsicum in liberal doses, from ten drops to a teaspoonful in water, every hour or two. If urgent dyspnea is present and fails to yield to the constant inhalation of oxygen, one must not fail to perform venesection. It is always needful to support the patient with an abundance of nourishing food like milk, freshly expressed beef-juice, egg-nog, etc.

## DISCUSSION.

DR. EDWARD JACKSON asked whether Dr. Mays had worked out the proportion of deaths in pneumonia to the number insured during these earlier years. There might be a very few deaths in the earlier years after

insurance and all of them occurring from pneumonia; and more deaths from pneumonia, yet a smaller percentage of the total deaths at a later period.





## SOME INSTRUCTIVE CASES OF APPENDICITIS.

BY H. A. HARE, M.D.

Read March 9, 1898.

In this brief paper I desire to bring to the attention of the Society several cases of appendicitis which seem to me to possess more than ordinary interest.

The first case is that of a man of about 19 years who came under my care for a sharp attack of abdominal pain, which was not referred to the region of the appendix, but half way between the ensiform cartilage and the navel. He gave the history of no less than nine such attacks in the previous six months, some of them so severe that morphin had to be given hypodermically. In none of them had the pain been appendicular in character. As soon as his abdomen was bared it was seen that a swelling was present in the right inguinal region, of considerable size, and though this swelling proved on palpation to be but slightly tender it was very hard and resisting. Even when the somewhat rigid wall above was relaxed, the mass remained hard and brawny under my fingers and was so large and dipped down so deeply that its borders could not be accurately determined. The possibility of malignant growth seemed to be excluded by the age of the patient, by the state of unimpaired general vitality, and by the history of the attacks, which were usually associated with some nausea and vomiting and the general typical symptoms of the disease appendicitis. The diagnosis was that of recurrent appendicitis with great thickening and deposit of inflammatory exudate about the appendix and perhaps about the entire caput coli. In other words, there had been several attacks of acute appendicitis with surrounding exudation due to the attacks, and a chronic inflammatory process between the attacks. These large masses of exudate made it evident that an operation would be difficult and almost impossible of good re-

sult if performed during the acute attack, and nothing was said to the patient about operative interference. When the attack which brought him to bed passed by, he refused operation, but after being impressed with the fact that nine attacks in six months indicated the speedy development of others, and that in any one of these a fatal result might ensue, and on the concurrent advice of one of our most able surgeons he at last consented to the operation, much against his will. At the operation, performed in the period of quiescence, the appendix was found greatly enlarged and thickened and surrounded by a mass of exudate. It was removed with some difficulty but with no serious damage to surrounding tissues. The operation was well borne, but within 24 hours nausea followed by stercoraceous vomiting ensued and the patient speedily died. There were no other signs of obstruction and the patient so quickly went into collapse that nothing could be done for his relief. I still think that my advice was good theoretically and correct so far as human foresight could perceive, but practically the man would have lived longer if he had not consented to the operation at my urgent advice.

The following case is, in some respects, the opposite of this. A man of 55 years had had, at intervals of six months, two attacks of violent abdominal pain and all the other symptoms of acute appendicitis. His last attack occurred two months before I saw him, when he came from a western city for advice as to operation. He saw, with me, two surgeons of high repute, who, in their examination, found some tenderness but no marked induration. As he was forced by his employment to be constantly travelling through small towns, he feared an attack when away

from home and competent skill, and, while naturally not desirous of operation, was willing to have it performed, if recurrences were thought probable. One surgeon advised operation as a prophylactic and curative measure, the other and myself agreed that it would not be necessary. This was four years ago, and there has been no sign of a third attack, the patient being perfectly well.

The third case was that of a man of 38 years, who, six months before I saw him, began to have severe pain in the right inguinal region. Usually, he had a paroxysm of pain about every week, and sometimes more frequently. The pain was sharply localized, and the appendicular spot of McBurney was exceedingly sensitive, when the patient was examined, although no attack of pain had been present for a week. He had lost ten pounds in weight since the attacks began, but his appetite was good, although he was constipated. He was treated by absolute rest and a careful diet, his bowels were regulated, and he had no attack for nine days previous to leaving my care. The tenderness disappeared, and he did also, so I cannot report on his subsequent history, but, in the light of the first and second cases, I am glad I did not urge operation. An interesting point in his case was an entire absence of fever in the attack he had while under my care.

The fourth case was that of a woman of 48, who was seized in the middle of the night with agonizing abdominal pain situated in the epigastrium and left inguinal region or between it and the middle abdominal line. I saw her at her house eight hours after the pain began, and found her still suffering greatly, but without agony. She had all the classical symptoms of appendicitis, vomiting, pain, exquisite tenderness over the appendix, and pressure on this point gave great pain on the corresponding spot on the left side. The pain was so well diffused that it was hard to tell where the most pain was felt. The belly was scaphoid and somewhat rigid. The appendicitis was so acute that I did not dare to advise against an operation, and the weather so hot, and the patient so feeble, that I did not care to advise it. A well known operator suggested operation, and then, as I did not like to oppose my views to his, I called in another medical consultant, who agreed that while an operation was strongly indicated by the condition of the appendix, the hot weather, and the feebleness of the patient was a greater dan-

ger when added to the effects of operative interference. The operation was not done, the patient was treated generally and locally by proper methods, and recovered in about three weeks. This was in June, 1895. Since then there has been no return of the trouble in any way, and I am glad for a third time that the knife was not used.

The fifth case is that of a woman of 33 years, who, between January 1st and May 15th, had four attacks of appendicitis, each of greater severity than its predecessor. An operation during each attack had been refused, and also between the attacks, on the ground that the risk of another attack would be taken. When the attack in May came on, it was so evidently an operative case that operation was insisted upon, and was performed at once. It revealed an abscess at the tip of the appendix of about one dram and the abscess-wall was ruptured in its removal. The wound was, however, carefully cleansed, and all pus apparently removed. The patient then progressed favorably for two weeks. The wound healed by first intention, and all seemed well, but there was no gain in strength. Fever now began to assert itself, and gradually became more and more marked, so that the chart resembled that of intermittent malarial infection. The old wound showed no sign of infection, the blood no evidence of malaria, and there was no history of malaria. The wound was then opened and found healthy, and was closed. Still, the fever persisted, and there was loss of weight. Finally, the wound was opened a second time, and to the site of the appendix, and everything seemed normal. The fever persisted, but no sweats appeared, nor were there any chills. Six weeks after the operation, pain in the abdomen became severe, the fever suddenly became accentuated, and the patient became partially collapsed. An examination of the abdomen now revealed for the first time a marked swelling in the right inguinal region, and evidences of peritonitis were marked. An operation was advised as the only resource, but, after the belly was incised, the patient so nearly died on the table, that it had to be given up. Death occurred two days later, and at the post mortem a large abscess of the right ovary and tube were found, with general peritonitis therefrom. Infection of these parts had evidently occurred from the ruptured appendix, as the woman was unmarried, and a virgin.

The delay of operation in this case, till the abscess was ready to rupture on the slightest touch, ultimately caused death.

The sixth case is that of a man of 40 years, very stout and of heavy build, who was seized in the night with excruciating pain in the groin and throughout the whole belly. When seen by me six hours later his belly was already swollen and tense or rigid. His pulse was rapid but otherwise good. The belly was exquisitely tender. Operation was insisted on and was performed in an hour. The appendix was found gangrenous at its tip. He promptly recovered and the interference saved his life without doubt.

The seventh case, and the last, is as follows:

December 26, 1896, I was called to see R. L., aged 10 years. I found him suffering from a moderate degree of pain which was situated in the right iliac region. He was in bed, had a coated tongue, and a temperature of  $101\frac{1}{2}^{\circ}$  F.

The history was that he had been taken during the night with several paroxysms of fairly severe pain and had had several that morning. A week before he had gone to bed he had had some nausea and gastric disturbance, probably due to intemperance in diet. Cross-questioning revealed the fact that during that week he had also had considerable pain in the bowels, although by no means so severe as at the time he was first seen by me. Not only was there marked tenderness over McBurney's point, but, as I have frequently noticed in such cases, the patient complained of a good deal of pain in the neighborhood of the transverse colon; but placing a hand under the flank, or in other words, behind the appendix, seemed to reach the tenderest spot of all. On that evening I asked his relative, Dr. Howard Kelly, to see him in consultation, and it was decided that the best thing to do was to insist upon perfect rest and a liquid diet and no medicine.

On the following day the pain was about the same and the rigidity of the belly-wall was equally marked. As he had been freely purged on the 25th by magnesium citrate and cascara sagrada it was thought wise to give him no purgative.

On the morning of the 28th the swelling and tenderness in the right iliac region was increased, and the pain was stated by the child to be considerably worse. Another

consultation with Dr. Kelly was asked for and he decided that Rochelle salt had better be freely given. This was done, but, after the third dose of a teaspoonful, vomiting took place; castor oil was then substituted and two hours later two free movements of the bowels ensued.

The temperature during the 27th and 28th was about  $99^{\circ}$  morning and evening. On the morning of the 29th the pain seemed to be slightly relieved for a time, but the tenderness on palpation was quite as marked as ever, and the boy stated that the pain was returning as the hours passed by.

It was determined that it would be wise to operate for appendicitis. An operation was performed on that day (Tuesday) by Dr. Kelly, assisted by Dr. C. P. Noble and two of Dr. Kelly's assistants from Baltimore. The appendix was found markedly inflamed, but contained no pus. There was a slight peritoneal hyperemia all around the area of the neighborhood of the appendix. The boy did very well after the operation, his temperature did not rise above  $99\frac{1}{2}$ , vomiting was very slight and the case progressed without any point of interest in connection with it for a period of ten days.

On Monday, January 10th, however, he was seized with violent pain in the belly, which, on examination, was found to be neither scaphoid nor swollen, although it was tympanitic on percussion. Pain was exceedingly severe and seemed to have its greatest point of intensity in a line drawn between the nipple and the anterior superior spine to the right of the umbilicus. At this point it was thought on careful examination that there was a sensation of increased resistance. The pain continued for 24 hours notwithstanding the administration of  $\frac{1}{4}$  of a grain of morphin, which gave him considerable relief for a short time. His temperature remained about normal.

On the second day, however, retching and vomiting became a prominent symptom and although not constant occurred with sufficient frequency to be considered a grave symptom. He was unable to pass anything by the bowel from the time the attack began, but no food had been given him which could in any way have produced intestinal complications. Repeated rectal injections failed to bring any result, except on one occasion when a slight quantity of wind was passed.

In view of his grave condition it was decided two days later, on Tuesday the 12th, that something must be done for his relief, and after consultation between Dr. Edward Martin, Dr. Kelly and myself it was decided that the boy should be etherized, inverted and that copious intestinal irrigation should be resorted to. At this time the boy was vomiting small quantities of liquid of a coffee-ground or grumous appearance, mixed with streaks of bright-colored blood, and there was marked abdominal distention. One and a half quarts of warm saline solution having been injected into the bowel without reducing the obstruction, the boy was placed upon the operating table; after the liquid had drained out by means of a rectal tube, Dr. Kelly opened the abdomen half-way between the umbilicus and his earlier incision for appendicitis. A small quantity of liquid was found in the abdominal cavity, there was evidence of slight peritonitis and two large knuckles of gut were found adherent to the abdominal wall producing intestinal obstruction by preventing peristaltic movement. These bands were broken up, the wound was closed and the child put back to bed in fairly good condition, considering the gravity of his case. Twenty-four hours after the operation the bowels were freely moved and a considerable quantity of fecal matter passed.

The case recovered from the operation very well indeed and was kept on a strict liquid diet for a period of four or five days. His temperature during this period was never febrile, but he suffered from time to time from more or less violent attacks of abdominal pain. His condition, however, steadily improved until Tuesday, February 2d, when I was called at 4.30 A.M. because he was suffering violent pain which was not relieved by a hypodermic of morphin given at 6 the previous evening. I found him suffering from excruciating abdominal pain, a tense and rigid belly and some slight nausea. The boy had had no movement since the

morning previous;  $\frac{1}{10}$  of a grain of morphin was given hypodermically, repeated at 9 the next morning without giving him material relief. I immediately telegraphed for Dr. Kelly, and after a careful examination it was decided that he had about one and a half quarts of liquid in his abdominal cavity and that there were evidences of adhesions obstructing the intestines. In view of the gravity of a third operation it was decided by Dr. Kelly, Dr. Martin and myself to take the risk of waiting 24 hours. At the end of that time the various rectal injections having failed, another one was given with the result that he passed a large amount of fecal matter and suffered no more pain. Convalescence was progressively established and the boy was considered as cured Friday, February 19th, although at that time there was still present, as there had been from his first getting up, February 10th, slight impairment of power in the lower extremities (partial paraplegia).

The case is one of interest because of the frequent complications and the gravity of each one.

These cases, which are taken as types from a larger series, illustrate the fact that the physician takes a grave responsibility if he urges an operation, perhaps as grave as if he opposes it; that he cannot afford to leave a decision as to the wisdom of operation entirely to his surgical colleague, and finally that cases of appendicitis often get well and remain well, or, in other words, all cases do not need an operation either for immediate relief or for the prevention of other attacks. On the other hand there are cases which are so fulminating in character that an hour's delay of operation is dangerous, and I am inclined to believe that the cases of early fixation of the body and belly muscles and without much temperature disturbance need operation more than those in which the pain is greater, more continuous, and more severe on pressure.

## DISCUSSION.

DR. JAMES TYSON said, he did not think he had ever listened to a more instructive series of cases than those which Dr. Hare related, and they impressed him with the difficulty of diagnosis. It never did seem to him an easy matter to diagnose a large number of cases of appendicitis. Unfortunately, so many cases cannot be confirmed as to diagnosis, except by autopsy or by operation, and he was inclined to think that some of the cases, at least, which do well without operation, are probably not cases of appendicitis. He thought the second case which Dr. Hare related was possibly not a case of appendicitis. He felt, with regard to his own experience in the diagnosis of appendicitis, that it is exceedingly difficult to be sure of the doubtful cases. There are a certain number of cases which, he was sure, are considered appendicitis, which are not appendicitis, and these are the cases which get well without operation. When the diagnosis is absolutely certain, as when it is confirmed not only by pain but by actual tumor and the peculiar hardness or resistance, which is so characteristic together with high temperature, he felt that the operation in a majority of cases is the safer procedure, although it may happen now and then that an operation terminates unfortunately.

DR. GEORGE ERETY SHOEMAKER, like Dr. Tyson, was impressed by the difficulty in the doubtful cases in which other organs are involved at the same time. He said that Dr. Hare would tend to lead opinion astray, however, if he should consider as closed the history of a case that had recovered without operation. The fact that a person has had no recurrence in two or three years, is not conclusive as to what would happen in the later years of that patient's life. It must be considered whether it is just to patients to leave them open to the grave danger which may arise at any time. It is Dr. Shoemaker's custom to advise operation when the primary attack has been severe and undoubted, but not to advise operation when it has been very slight and has promptly undergone complete resolution. When summoned during a primary attack operation is deferred if the symptoms are only moderate and show decided improvement within thirty-six or forty-eight hours, but great caution must be used lest improvement be deceptive.

Finally he always advises operation during or after a decided second attack. That seemed to him the safest and fairest to the patients. Taking this present group of cases together, the percentage of bad results is very large. Of course, one could not consider percentages founded on so few cases. Treves gives his mortality of operation between attacks as 2 per cent. It is in general much larger than that. Only in the hands of the very skillful does it nearly approach it; and only then if cases almost moribund when first seen are excluded. It seemed to Dr. Shoemaker that it is much wiser and safer in the vast majority of cases to remove the possible danger by operation, if possible in the interval of quiescence.

DR. J. M. FISHER invited attention to the fact that the difficulties in diagnosis are especially accentuated in cases of appendicitis occurring in women. He has seen a number of cases in which not only the appendix was diseased, but likewise the right uterine appendage. It would be hard to say whether or not the disease had begun in the appendage, or the uterine appendage became diseased subsequently, or vice versa. He recalled a case very distinctly, at St. Joseph's Hospital, in which he was asked to assist a gentleman, who had had quite a large experience in general surgery as well as in gynecological surgery, and who had made a positive diagnosis of rupture of an appendicular abscess. The abdomen was opened and the appendix brought up through the wound and found to be perfectly normal. But on passing the fingers into the pelvis it was found that the ovary upon that side had been diseased, and that an abscess had ruptured. This was the first cause of the symptoms of peritonitis and of the shock present at the time of operation.

There was another case that Dr. Fisher had referred to in another Society, a woman who had been operated on for appendicitis and who had her appendix removed. The diagnosis had been made of catarrhal appendicitis. The appendix was removed and the patient suffered subsequently just as she had suffered previous to the operation. She happened later to come under Dr. Fisher's care. He diagnosed a pus tube on the right side, opened the abdomen, and the symptoms subsided. He thinks it is well in

all cases, especially in women, to make a pelvic examination. The difficulty in diagnosis is particularly marked in females where there is right sided uterine disease.

DR. MARY ALLEN related, as a contribution to the question of diagnosis, the history of one of her patients who, while riding a bicycle, had struck herself in the abdomen. There was ensuing distress, which first abated, but some time later recurred and was referred to the region of the uterus and ovaries. It was at this period Dr. Allen was consulted. An examination led her to diagnose traumatic metritis and to treat the woman for that trouble. The next day found the patient much worse, with a tympanitic abdomen and severe pain in the region of the appendix. Turpentine stupes and other external applications did not relieve the condition, which seemed to point to appendicitis.

Dr. Allis, in consultation, suggested that injections of milk of asafetida be given to rid the intestines of gas before the question of operation be decided. The injections were given three times a day, and nine quarts of milk of asafetida were used. The tympany and pain and tenderness; disappeared, but the trouble with the uterus again manifested itself. Treatment of the uterus by the vagina was followed by a flow of pus and the extension of the pain to the left side. The movement of the left leg was limited and the tube on the left side was affected as well as that on the right. Both tubes leaked into the pelvic cavity and there were many adhesions. After trying for some time to get rid of this condition, removal of the appendages was advised. The patient refused operation and called in a homeopathic practitioner, who at first told her that she was entirely too weak for an operation, and who, three weeks later, had her removed to the Hahnemann Hospital, where her uterine appendages were removed and she recovered.

DR. H. A. HARE closed the discussion, saying that he did not bring forward these cases as being indicative at all of the average mortality of appendicitis, but chiefly on account of the case of the young man with the large swelling in the groin, who was persuaded to be operated on against his fears and then promptly died.

A prior case was that of a young fellow with very rapidly developing appendicitis in which the symptoms were exceedingly obscure, in which surgeons concluded an obstruction

of the bowels was present as much as appendicitis, and operating in the middle line in that belief they found a band of adhesion obstructing the bowel. The first impulse was that they should go no further, but they did and it was then found that the boy had not only obstruction of the bowels but active fulminating appendicitis. The removal of the diseased tissue and that of the band resulted in recovery. This so impressed Dr. Hare with the life-saving properties of operation that he waxed eloquent in his clinic on the first patient, and then when he was cast into the "Slough of Despond" by the rapid death of the patient, he felt and still feels, that it is sometimes exceedingly difficult for the physician to decide as to operation when it becomes his duty to express an opinion. He thinks physicians were at first not inclined to call in the surgeon until the case was so grave that they could do little. The pendulum is swinging the other way now and the surgeon is called in early and perhaps thinks that he is called in to operate, and his advice is certainly more often to operate than the contrary. The physician, in a way, throws all the responsibility on the surgeon. This satisfies the physician's conscience, but does not affect the opinion of the family in regard to the good or bad result.

Dr. Hare agreed with Dr. Tyson that appendicitis is not so easy to diagnose as some of our surgeons would have it believed. He holds that there is an atmosphere about patients who ought to have an operation because of gangrenous appendix, that there is an anxiety of expression, and that there is a stony hardness of the belly in the neighborhood of the appendix, the belly being neither scaphoid nor tympanitic. In the case with gangrenous appendicitis it was the patient's general state which made him think operation was instantly demanded. The points which he wished to emphasize in his paper were not so much the diagnosis, not so much the statistics of mortality of operation, but the fact that the physician's responsibility in these cases is very grave. Even if the physician calls in a surgeon he cannot afford to let the surgeon decide for him in every instance that an operation ought to be performed. If the woman of 40 had the operation performed she would have died as the result of the shock and hot weather. Three years, so far, have been added to her life by deferring operation.

## CECAL HERNIA WITH A CLASSIFICATION OF SIXTY-THREE CASES.

BY JOHN H. GIBBON, M.D.

Read March 9, 1898.

IN this article there are classified 63 cases of inguinal or femoral herniæ in which a portion of cecum or appendix was found in the sac. Fourteen of the cases have not been published before and the rest are collected from recent literature on the subject. The author is led to believe that this variety of hernia is more frequent than is generally supposed, that early youth and old age are the periods of life during which it is most likely to occur, and that, except in adult life, the condition is usually congenital.

In 642 herniotomies done by Coley and Halsted, cecal hernia was met 21 times and only three of these patients were over 15 years of age. Of the present 63 cases, 36 were in patients under 15 years of age, 5 were between 15 and 40 years, 7 between 40 and 50 years, and 15 in patients past 50 years.

The condition is more frequent in males than in females because of difference in structure and because of the descent of the testis in the male.

The cause of cecal hernia of the congenital variety is probably the attachment of the appendix and cecum to the testicle before its descent. In adult life this condition is most likely due to a small movable cecum and a pre-existing hernia of small intestine.

The idea regarding the sac of cecal hernia has changed and it is now generally

accepted that the peritoneal covering of this variety of rupture is seldom deficient. This is largely due to investigation made by Mr. Treves.

Regarding the condition of the appendix in these cases, it is concluded that disease of this organ is not as frequent as might be supposed, and it is much more apt to be inflamed when it is alone in the sac than when it is accompanied by other portions of the intestine. In the table of cases now reported, there are several instances of perforation of the appendix in which the sac was filled with pus. In other classifications, Bajardi's for instance, the diseased appendix is met with much more frequently than in the present series.

The diagnosis can be positively made only when the appendix is palpated, as is often possible in children and in old people when the tissues covering the hernia are very thin.

The treatment differs little from that of other herniæ except when the presence of the appendix is diagnosed. Then operation becomes more imperative because of the danger of returning a diseased appendix to the abdominal cavity. The treatment of the appendix itself in these cases will depend upon its condition and the personal attitude of the operator to the general question of its removal.

## DISCUSSION.

DR. R. G. HARTE had been fortunate enough to see three or more of these cases. He said he was surprised at several points brought out in the paper in regard to the frequency of cecal hernia, and also that a

man like Treves should say that these cases were usually found in adults. Dr. Harte's experience is that these cases were usually found in young persons, in children or in very young adults. Many of these herniæ are

congenital. There is a tendency to relaxation of the mesentery in children and this naturally would tend to permit these rather irregular forms of hernia. Dr. Harte does not think there is any positive cause of cecal hernia except the long mesenteries sometimes found in the young. He has been rather struck to find that the cecal attachments sometimes varied so much in different individuals, and he has seen cases where, if hernia existed, there was no reason why the cecum could not work its way down.

DR. T. S. K. MORTON expressed his interest in the subject of cecal hernia. This, he said, includes hernia of the appendix and is an important question in abdominal surgery, and one which has received insufficient notice as regards its etiology. The age at which this trouble is most frequent, whether the gut is or is not invariably covered with peritoneum, and the question as to the proper mode of operation are all exceedingly important topics. Statistics and experience point to childhood as the period of most probable occurrence for this affection. Dr. Morton is inclined to the belief that, as the abdominal viscera increase in size during maturity, perhaps some cecal herniæ, present in infancy, are drawn up into the abdomen and disappear in later life. The question as to various prolapses of abdominal viscera bears not only upon cecal but upon all herniæ. Ptosis of various organs certainly must possess some relationship to hernia. Just what this is remains to be discovered. Dr. Morton thinks that it may accompany cecal hernia. He considers that operation for cecal hernia

is not always so easy as perhaps might be inferred from the remarks contained in the paper. Cases are on record in which excision was resorted to when it had proved exceedingly difficult or impossible to make restitution. The only case seen by Dr. Morton was a congenital one in which there was an absence of sac and the reduction was marked by very great difficulty. In fact, the question of excision arose at one time during the operation, but steady traction upwards accomplished reduction. Excision of course would make the herniotomy a very serious operation. Still it is perfectly feasible to-day and can be done without great difficulty by either sutures or anastomosis buttons. The attention of surgeons will be called more particularly to this form of hernia by Dr. Gibbon's communication and by his large addition of fourteen cases to the record. One exceedingly interesting point is the band mentioned by several authors as connecting cecum and testicle or some portion of the interior of the scrotum.

DR. GIBBON, in closing the discussion, said that probably he had not laid so much stress as he should upon the tendency to strangulation. In looking over his table it will be found that in nearly every case adhesions were present, either between the contents or to the sac itself. Another fact which should be accentuated is that of the 63 herniæ 28 were strangulated and only 12 were reducible. It is this tendency to strangulation and the formation of adhesions which is productive of the difficulty in reduction of which Dr. Morton speaks.



## STENOCARDIA; ITS PHYSICAL TREATMENT AND THAT OF ALLIED AFFECTIONS.

BY H. NEWTON HEINEMAN, M.D.

Read March 9, 1898.

THE author pointed out the fact that heretofore the profession had held the opinion that every case of this affection was necessarily associated with marked atheroma and calcification of the coronary arteries. This had given rise to a great limitation among the cases which, by reason of their history, should really be included in this affection.

The writer maintained that a large number of cases suffered from comparatively few and simple symptoms. These symptoms were always referable to the heart, although in many cases associated with an exciting cause in some other organ of the body, such as the stomach (the dyspeptic symptoms), the intestine (constipation), the lungs (bronchitis), and the like. To make his meaning clearer the author referred to a series of cases, which may be summarized as follows:

CASE I.—A man of 50, who gave few of the characteristic symptoms of angina except slight pain and precordial fullness. At the autopsy the heart was found *apparently* normal to the naked eye, but microscopic examination revealed changes in the coronary vessels, and slight, though decided, myocarditic changes.

CASE II.—A female, 23 years of age, of gouty ancestry, who had complained of anemic symptoms and often had suffered from attacks of apparent nettlerash, really spasm of the capillary vessels. The latter appeared in the form of large swellings all over the body and on two occasions were accompanied by swelling within the larynx, so that the patient's life was in danger for several days, tracheotomy being imminent throughout the attack. This young woman complained of attacks of intense agonizing pain referable to the precordial region, the

pain being of a lancinating character. At times it passed upward towards the larynx and again downward into one, or both, arms. The attacks were repeated, sometimes daily, and again would remain absent for months. Under treatment by baths and exercises this patient made a complete recovery, at least her angina disappeared and has remained absent for two years.

CASE III.—A man, 44 years of age, stout and robust, who had always been well, began to suffer without previous warning and without previous dyspnea, but with pains referable to his heart. The symptoms, which were brought on by any overexertion, but particularly by walking, were a distressing sensation of expansion referred to the heart, accompanied by such distress that, at the time, the patient was unable to walk another step, and was compelled to remain at the spot until the lapse of a half a minute, sometimes of one or of several minutes, when he again could proceed, but after a short continuation of the walk would be again seized with similar symptoms, being finally compelled, at such times, to be *driven* to his home or to his office and to remain there for the rest of the day. Under treatment by exercises the man materially improved. Unfortunately the patient passed from observation, discontinued treatment and shortly afterward suddenly died. The autopsy revealed a condition similar to that of Case I.

CASE IV.—A man, born in Italy, suffered for three years with angina. Because of his syphilitic history he was dosed with iodid, without result. However, the iodid was repeated and repeated, the patient only getting weaker and the attacks of pain in

the heart, which extended into both arms, steadily grew so much worse, that finally, not only walking or facing a wind brought on an attack, but every exertion, even the taking of food, and at last the drinking of a glass of milk, if in the slightest degree cool, would initiate the symptoms. The patient had been seen by prominent European physicians. He finally, in 1895, came to Bad Nauheim, where he was treated by baths and exercises. He repeated the treatment three successive summers and has been free from attacks since, save for a slight threat occasionally after an indiscretion.

**CASE V.**—Female, married. Has had cardiac trouble since infancy and rheumatism repeatedly. She now has mitral and aortic valvular trouble and has had attacks of precordial pain shooting into the arms and on several occasions slight edema of the lungs after coitus. The patient was treated by baths and exercises and made so considerable an improvement that (except after exceptional fatigue) she was free from her attacks and then the symptoms were few and much lighter than formerly.

**PATHOLOGY.**—The etiology involves in the first place a certain diseased condition of the coronary vessels or of the heart-muscle. The affection of the coronary vessels may, for the time, be functional or it may have already reached the stage of pathological change. The heart-muscle need not necessarily have suffered permanent change, for if it be temporarily deprived of its oxygen the muscle will falter and give rise to the symptoms. If the muscle has become changed it will be all the easier for a functional or organically changed coronary vessel to affect it. With this as a simple condition we get all intervening stages possible up to the extremes of calcification of the coronary vessels and myocarditic muscle-changes.

**ETIOLOGY.**—Gout and rheumatism, tobacco and alcohol, syphilis and lead poisoning, acute and chronic infections of various kinds, overwork, overstrain, coupled with bad hygiene, all are predisposing causes in the changes of the coronary vessels and heart-muscle.

**EXCITING CAUSES.**—As exciting causes can be mentioned any form of overexertion, finally, any form of exertion, for example, walking, particularly against the wind; walking upstairs, also cold, the placing of

hands in cold water, the use of a cold sponge, even in patients in whom it has been a life-long habit; coitus, even when within bounds, and of course, when excessive; the taking of food, especially of large quantities, particularly of indigestible kinds; the use of large quantities of water, particularly if cold and at the table, and sometimes when between meals; constipation, dyspepsia, bronchitis, and numerous other lesser causes, not omitting the use, whether moderate or excessive, in some patients, of tobacco and alcohol.

**SYMPTOMS.**—The writer inveighed against the too rigid application of the term pseudo-angina, for he believes that a large number of cases excited by dyspeptic and other symptoms which disappear for the time when the exciting cause is removed, are none the less true cases of angina. He maintains that in a large number of such cases, sooner or later, the symptoms of angina recur. The writer further states that the symptoms of pain in the region of the heart may exist alone without the characteristic accompanying symptoms for many years, and yet such cases are never included under angina, but should often be so. Still further, the group of cases which present the severe symptoms associated with so-called spastic changes of the blood-vessels, or which have been described by Nothnagel as angina vaso-motoria, should be considered simply as complications or really graver symptoms of this affection. Jakob's "angio-spastic dilatation of the blood-vessels" is shown by slight edema of the lungs, of the feet or legs, sometimes by congestion of the liver or spleen, and at times by involvement of the kidneys, and all these symptoms should be included in the *severe forms* and under the heading of angina. The writer finally referred to the usually accepted and well-known forms of this affection.

**TREATMENT.**—The writer wished to emphasize that the treatment which was the special object of his paper should not, however, although of the greatest value, be placed or considered in a position to replace that regular medicinal treatment which we have always been in the habit of using in the simple and early stages of cardiac disorder. Nor should it induce us to set aside the usual treatment of symptoms and complicating conditions. In other words, the author begged that when a case of cardiac disease

should present itself to the average practitioner the case be viewed in a commonsense manner and the ordinary and well-known principles of treatment should be first applied. After these have done all that is possible, then the use of the physical means give us additional agents by which still more can be accomplished. In a second class of cases, in which the ordinary treatment fails of result, we can at once resort to physical treatment. A third group is that class in which the patient arrives at a stage of loss of compensation for which all remedies fail. If such cases be given bath treatment for a time, with or without exercise, it is surprising how well and effectually the drugs, which prior to the baths failed of result, will now again yield effects as though the patients were in an early stage of the trouble.

**BATHS.**—The baths of Bad Nauheim are characterized by the presence of large quantities of alkaline salts, particularly of chlorids and carbonates, of calcium chlorid in very large quantity, and of free carbonic acid in more than ordinary percentage. Every liter of the water contains a liter and a quarter of carbonic acid gas, of which two-thirds is free and the rest half bound. The waters are naturally warm, or thermal. The temperature varies from 31 to 33 or 34° C. The waters are collected in open reservoirs, again in closed reservoirs, and finally they are, to get the strongest effect, not drawn from the reservoir, but led directly through pipes from the source directly to the tub. The last form of bath, which is the strongest, is called "Sprudel" or "effervescent" bath, and is still further modified by having an opening at the upper level of the water in the tub, and allowing it to flow out above as rapidly as it flows in below. The latter is called Sprudel-Strom bath and resembles, in its effects, the waves of the Ocean. The baths, usually from twenty to twenty-five in a course, given at first on alternate days, then on two, very rarely on three days in succession, have, at first, four or five minutes' duration, which is gradually increased to eight or ten minutes as a maximum.

It is imperative that the patient be aided in dressing and undressing, and also be under the observation of an attendant, for reasons to be explained. The patient should always rest for an hour after the bath.

**ARTIFICIAL BATHS.**—The writer referred to his paper before the Academy of Medicine in New York in November, 1896, in which he gave details for the making of artificial baths. The writer begged to say that from 60 to 70 per cent. of the effect could be secured from artificial baths. It is essential, however, according to the author, that some apparatus capable of charging water under pressure with carbonic acid, and which apparatus should be so arranged that the quantity of carbonic acid can be accurately gauged, should be made use of in order to place the artificial treatment upon a scientific basis and one from which we could hope so to arrange matters that we could always get approximately the same result in the same condition.

**EXERCISES.**—The writer warned his hearers that in more than half the cases nothing but the bath treatment was used, however, the use of the proper form of exercise materially added to the efficacy of the result in appropriate cases.

Massage is a form of exercise which, when applied, not as severe massage, but as simple stroking massage, could be applied to almost every case. In fact, few cases are not benefited by its application and in many cases it is the only form of exercise that can be resorted to. In some cases cardiac massage, as described by Oertel, may be made use of.

Ordinary walking to and fro in a room, breathing regularly and being clad in light flannels, and, in the case of females, without any weight of clothing about the waist.

Next, the use of an incline, or, going up stairs, taking a few steps at first and gradually increasing the number. This is a modification of the hill-side climbing recommended by Oertel.

As to hill-side climbing itself, it is rather dangerous to carry out, and even in the appropriate case requires the presence of the medical attendant to make it free from danger.

Pulmonary calisthenics or regulated breathing without fatigue is another form of localized exercise, which is not without good effect upon the heart.

The exercise with resistance, first introduced by August Schott and now well known to all, is a form which can be applied to a very large number of cases and with most excellent results. The writer warned

his hearers against the abuse of this form and gave exact directions for its limitation. Finally he suggested the use of the Zander-

Swedish system in patients who had made a complete recovery and who could not take other forms of exercise.

## DISCUSSION.

DR. J. H. MUSSER, referring to the value of exercises in the treatment of cardiac disease, especially of resistant exercises, related the subsequent history of the cases which he reported last year, when Dr. Cohen read a paper on this subject.

One case of cardiac enlargement has recovered entirely and no evidence of dilatation remains. The patient is now engaged most actively in duties to which, two years before, he would not have thought of attending. He had had several attacks of acute dilatation of the heart and of edema of the lungs. He had also suffered from dyspnea and was unable to continue his ordinary duties without extreme suffering.

Another patient whom Dr. Musser reported, at that time, is in comparatively good condition. Two of his hospital cases have been lost sight of and two of them improved for a time. One of the latter was readmitted to the Philadelphia and the other to the Pennsylvania Hospital and later died. This does not condemn treatment by these methods, because these patients made themselves liable to relapses into their former condition. Dr. Musser was glad to hear Dr. Heineman speak of angina relieved by the onset of regurgitation. He had made a similar observation in a series of cases he reported to the Association of Physicians last year, and two or three such cases have come under his observation during the past winter.

DR. JAMES TYSON asked Dr. Heineman whether he found special forms of heart disease more benefited than others, as, for instance, aortic regurgitation as contrasted with mitral diseases, or the reverse. Dr. Tyson himself has found that cases of renal disease with heart failure resulting from dilatation following hypertrophy have been signally benefited by baths.

He showed also an appliance devised by Mr. Smitheman, one of the students of the University of Pennsylvania, for furnishing carbonic acid gas in the home-made baths,

it being well known that the most unsatisfactory part of such baths is the arrangement for supplying carbonic acid. This has heretofore been done by decomposing sodium bicarbonate by hydrochloric acid. The device exhibited is a wooden framework, to the under side of which are attached tubes which are connected with a large cylinder, whence an unlimited stream of carbonic acid gas can be sent through the bath. The gas is delivered below the frame and comes up through spaces in it. The water can be made to foam with carbonic acid, which can be introduced in varying quantities. The unpleasant effect of the inhalation of excess of carbonic acid by the patient, alluded to by Dr. Heineman, is very prominent. But the quantity of gas can be so regulated as to reduce any disagreeable quality to a minimum.

DR. S. SOLIS-COHEN recognized that in the application of this method the physician, like the painter, must mix his colors with brains. Individualization of cases is necessary, and measures of treatment must be modified, combined, adapted accordingly. Dr. Cohen's own experience since his report to the Society a year ago has continued to be rather favorable to the treatment by baths and exercises, but he has found that, in some cases, it has not been possible to get patients who have experienced immediate relief either to continue the line of treatment, or to remain under such hygienic restrictions as are necessary to keep up the good effect obtained. Thus, for instance, one of Dr. Cohen's cases, a physician suffering with mitral stenosis and angina pectoris, has since died from the results of indiscretion in attempting to resume a wearying obstetric practice. Another case has relapsed and refuses to undergo the same treatment again. In half a dozen other cases the result has been excellent and the patients have continued in fairly good health. The patient presented to the Society a year ago has passed out of observation, but it is

presumed that she would have been heard from had there been any return of trouble. It may be remembered that she suffered with arterio-sclerosis, with symptoms of myocardial degeneration, and with albuminuria, and that she was relieved remarkably. Dr. Cohen believes that the Schott-Nauheim treatment deserves the encomiums given to it, and is worthy of all the study that practising physicians can bestow upon it. He is confident that it can, in great measure, diminish the use of drugs in chronic cardiac affections and that it often enables relief to be given that could not be attained otherwise.

DR. ROMINE was invited to relate his personal experience at Bad Nauheim, and said that the only difficulty he saw in the arrangement presented by Dr. Tyson is that the water refuses to absorb enough gas to be very beneficial. It leaves the water as soon as liberated in it. Speaking of the treatment at Bad Nauheim, Dr. Romine said he had especially observed the case of a young man who had arrived there afflicted with rheumatism, valvular disease, general edema and ascites. The least exercise caused him great dyspnea. He had also lost his appetite and was practically a wreck. Six weeks' treatment benefited him greatly and enabled him to take long walks.

Dr. Romine believed that too much attention had been paid to the commercial side of Bad Nauheim and too little to the professional. From his own observation the matter of diet was absolutely neglected. The vital importance of diet is commonly appreciated, yet patients at Bad Nauheim are allowed to go to hotels and eat what they please and to take their baths in a careless way. He thinks this will be corrected by the methods of a few scientific men which will so impress visitors as to compel other methods to be abandoned. He said he had heard it remarked that this treatment is not very satisfactory because the treatment must be kept up or relapse ensue. The danger of relapse is no more a sound argument against the prolonged character of this treatment of heart disease than it would be against the treatment of pneumonia; the distressing character of heart disease especially demands relief; and if the treatment cannot be duplicated artificially, he thought

most cardiac sufferers would be willing to endure an ocean voyage and give up three months of the year to enjoy possible relief at Bad Nauheim.

DR. HEINEMAN, in closing the discussion, said it would be absolutely wrong for him not to call attention to the measures that should be adopted in treating heart disease. When a case of cardiac disease presents itself, use common sense; if the patient has a bad gastric disorder treat him for it; if the case has a bad liver, or if the patient is anemic go to work and see that the patient gets over the condition and, in addition to that, resort to old remedies used for many years, digitalis, strychnin, quinin and the like. In appropriate cases, when good results have been obtained by these methods and when the patient has means, it can be said to him that the intervals of his feeling well can be made much longer than has been accomplished before, and the Bad Nauheim treatment may be advised. Or, if the other side of the case comes up, and nothing else can be done for him, then one is justified in attempting to do at home what one can by this form of treatment. One must not run away with the idea that there is no treatment for heart disease but Nauheim, and that all we have heretofore known and done for cardiac diseases is worthless. Dr. Heineman, for one, wishes to be among the very first to place his veto against any such procedure.

The question of dietetics is of importance. Many cases of cardiac disease die after a hearty meal. They get the stomach full and that is the end. Patients should be cautioned not to take large quantities of liquids into the stomach at the time of eating, to particularly look after their diet and so on.

As to the class of people the treatment applies to best, it is particularly the well-to-do class of patients who are benefited. The blacksmith who has once had loss of cardiac compensation, even with the bath treatment, will never again wield the heavy hammer. Such patients have heretofore been condemned absolutely to a life of inactivity. This for a poor man means pauperism. Some provision might be made for these cases to go to a convalescent home and be taught some light occupation. In the well-to-do some very brilliant results are achieved.

## ULCER OF THE RECTUM—STRICTURE OF THE RECTUM DUE TO SYPHILIS.

BY ORVILLE HORWITZ, B.S., M.D.

Read March 23, 1898.

ULCER OF THE RECTUM as a result of tertiary syphilis is not an uncommon disease; unfortunately it is frequently overlooked, and not detected until contraction of the bowel has taken place. It is generally accompanied by chronic diarrhea, and as a rule is treated by remedies employed for that disorder, which, however, produce but temporary relief.

Ulcers and their sequelæ, strictures of the rectum, occur most frequently in females; no satisfactory explanation has been offered for this; out of 110 cases reported by Allengham 92 were females. Julian collected the histories of 60 cases; of these 53 were women. Of the numerous cases that have come under my observation the majority were women.

The principal causes of ulceration of the rectum are syphilis, obstinate constipation, chronic dysentery, injuries of the vagina and uterus incurred during parturition; and occasionally an ulcer follows operations on the rectum, when the patients are debilitated, and broken in health. The first two causes here given are probably the most frequent. Cases sometimes present themselves in which the practitioner is unable to account for the origin.

The symptoms vary with the stage, extent, and character of the ulceration; the two cases here recounted present those ordinarily associated with extensive ulceration:

Mary L., aged 41, dressmaker, on admission to Jefferson Hospital gave the following history: Fifteen years before presenting herself for treatment, she had contracted syphilis from her husband. At the first onset of the disease she was attacked with a general eruption extending over the

body, accompanied by sores in the mouth. From time to time she has had repeated relapses for which she has been treated specifically. She has had two miscarriages.

For three months before presenting herself for treatment she has suffered from diarrhea. The desire for defecation manifests itself on arising in the morning. The movement consisted of a small amount of liquid fecal matter, a dark coffee-ground-looking discharge, sometimes accompanied by pus. The movement was not followed by relief, and in a very short time there was again a desire to evacuate the contents of the bowels. With this condition was associated a burning sensation in the rectum, accompanied by tenesmus followed by the discharge of small lumps of fecal matter, streaked at times with blood. Again she would pass several hours of comparative comfort, when the irritability of the bowels would return, associated with flatulent distention and gripping pain in the lower portion of the abdomen. Her appetite was poor, she has lost weight, and suffers from indigestion. Pain in the rectum was produced and increased by exercise and sometimes was sufficiently severe to interfere with her nocturnal rest. She frequently has wandering pains in the back extending down the thighs. Her diarrhea is at times accompanied by nausea, with a feeling of faintness.

On examination, an ulcer of the rectum was found about two inches from the sphincter; it was of oval shape; about one inch in width, by one and a half inches in length. The edges were elevated and indurated; the base was of a deep red color; and the ulcer was covered, in spots, with thick, grayish mucus. The mucous mem-

brane surrounding the sore was markedly congested.

The second case is that of an inmate of the Venereal Ward of the Philadelphia Hospital. The history is somewhat similar to the case already detailed. The patient is 31 years old, and when 22 years of age contracted syphilis, for which she was specifically treated from time to time. Her rectal symptoms existed for six months prior to her admission into the institution. Examination revealed an ulcer in the rectum about an inch above the sphincter. There was an infiltrated and inflamed condition of the mucous tissue, a loss of contractile power on the part of the rectum, and a relaxation of the sphincter ani causing an inability to retain the feces. At the upper point, where the ulcer had healed over, the bowel had become contracted in a marked degree, perceptibly reducing the caliber of the tube. Externally five fistulous openings communicated with the bowel, and a small fistulous communication had been established between the rectum and the vagina.

In simple ulceration of the rectum the history of the case will usually serve as a guide to diagnosis. Interrogation will usually elicit a history of chronic dysentery, or of a tendency to the development of tubercle, or of acquired or inherited syphilis. In the early stages of benign ulcer the mucous membrane surrounding the sore is thickened and movable. At the onset, malignant ulceration presents the same appearance as that of the benign type; there is no glandular involvement, but frequently indurated masses may be felt in the submucous tissue, in the vicinity of the ulcer. Also the differential diagnosis between advanced syphilitic ulceration of the rectum and carcinoma is often extremely difficult, if not impossible.

Epithelioma of the rectum in women is a very rare disease, whilst ulcer is not at all uncommon. The feeling elicited by the touch in examining a rectal carcinoma is peculiar and characteristic, and must be experienced by direct application of the finger to be appreciated, but when once detected cannot afterward be mistaken. Cancerous ulceration, as a rule, occurs at a later age than that of the syphilitic variety, and the further advance of the two diseases is entirely different.

It is still more difficult to establish with

certainly the diagnosis of ulceration due to tubercle. In suspected cases tubercle-bacilli may be detected by microscopic examination, but time alone gradually makes positive the differential diagnosis between benign and malignant ulcer of the rectum.

In the numerous cases that have come under my observation I have been struck with the apparent connection between hypertrophy of the external genital organs in women, and syphilitic ulcer of the rectum accompanied with stricture.

**TREATMENT.**—The treatment is naturally divided into constitutional and local. The first indication is to place the patient in the recumbent position and keep him at perfect rest. As a rule the diet should be in a large degree liquid and should consist of concentrated nourishment taken in small quantities at short intervals. Such substances as milk, broths, raw oysters, raw or soft-boiled eggs, beef-juce, arrow root, custards, curds and whey, and rice pudding are to be principally employed.

If the milk gives rise to flatulence and curdles in the stomach, it may be mixed with equal parts of thoroughly boiled oatmeal strained through a cloth; at the same time 5 grains of taka-diastase may be given before meals, and one of the capsules, composed of the following ingredients, may be administered after eating:

Strychnin sulfate.....	1 grain.
Beta naphthol.....	2 drams.
Aromatic powder.....	14 grains.
Oil of cajeput.....	40 minims.
Mix.	

Make twenty capsules.

I have not derived any benefit from the employment of specific treatment *per os*, when the digestion has been notably deranged, or when the intestines are in an irritable condition, but have obtained most satisfactory results by the administration, hypodermically, of corrosive sublimate in appropriate quantities. The usual dose is a quarter of a grain; but if the patient be weak and debilitated, the quantity administered should be reduced to one-sixth of a grain, once a day.

This treatment may be pursued for the space of from 20 to 30 days, depending on the effect produced. If there is no tendency to salivation, if the patient gains in weight, and the frequent examination of the blood shows that an increase in the red corpuscles

of the blood has taken place, the remedy is to be continued for the length of time indicated. If, on the contrary, the patient should exhibit evidence of approaching ptialism, with loss of weight and decrease of red corpuscles of the blood, the dose should be decreased, or the medicine discontinued.

The use of potassium iodid, recommended to the profession by many authors, has proved useless in my hands, unless there be evidence of commencing stricture, or unless a gummatous infiltration of the submucous tissue be present. Where the patient is anemic, broken in health, or suffers from loss of appetite, and indigestion, the iodids are far from beneficial, and, indeed, may be said to be decidedly harmful. The stomach should be spared for the purpose of assimilating simple, nourishing food, and for the reception of such remedies as increase reconstructive metamorphosis.

**LOCAL TREATMENT.**—The best results have been obtained from the lavage of the lower bowel with a warm solution of silver nitrate of a strength of one part to five thousand (1 : 5000). An ordinary soft rubber-tube should be employed, which is to be introduced into the rectum for the distance of from 6 to 8 inches. A quart to a quart and a half of the solution should be used for each irrigation, which, as a rule, should be repeated daily.

As the ulcer begins to cicatrize, Kemp's rectal irrigator is to be employed instead of the india-rubber tube. After the fluid has been ejected, an aqueous solution of iodoform is to be very gently thrown into the rectum and allowed to remain. The combination to which I give preference is composed of:

Gum tragacanth.....	40 grains.
Iodoform, sterilized.....	340 grains.
Rectified spirit.....	80 minims.
Distilled water.....	8 fluidounces.

Use one fluidram at a time.

Mix.

When the ulcer begins to cicatrize, and the general condition of the patient improves, benefit may be derived from touching the ulcer very gently, from time to time, with silver nitrate in the form of a pencil. Should chronic proctitis exist, after the ulcer has healed, benefit will be derived from the use of a daily rectal injection of a saturated solution of the potassium chlorate.

I have employed the treatment here indicated in a large number of non-malignant

ulcerations of the rectum with the most satisfactory results, and feel justified in recommending it to the profession. It may not be out of place to remark that I have derived but little permanent benefit from the employment of the usual so-called "diarrhea mixtures." If there be great tenesmus, accompanied by diarrhea, a pill containing a half a grain of old opium, administered as occasion demands, may be given in addition to the local and constitutional treatment recommended. After the ulcer has healed, should there be the slightest tendency to contraction at the seat of the scar, thereby threatening obstruction, the rectal bougie is to be employed without delay.

*Stricture of the rectum*, due to syphilis, is usually a sequence of ulceration, and is generally situated within the first three inches of the bowel; this was the condition in sixteen of the eighteen patients that have been under my care. The two remaining cases were located just back of the sphincter ani.

Strictures are usually annular, involving a portion or the whole of the lower bowel. As a general rule they are most dense and well-marked on the floor of the rectum. When the bowel has been extensively ulcerated the stricture will be found to be tubular, and the prognosis will be unfavorable; the bowel will be merely a passive tube; there will be loss of control of the sphincter with inability to retain the contents of the intestinal canal. Abscesses and fistulae are frequent accompaniments of this condition. The feces are usually either like small pellets, or are flattened out like a ribbon, and are often accompanied by a mucoid discharge. Frequently diarrhea alternates with constipation. Sometimes there is an offensive discharge from the rectum, which excoriates and irritates the skin in the vicinity of the anal opening. If the obstruction is great the colon becomes distended, and is readily outlined by palpation, being tender to the touch. The patient complains of pains in the pelvis, extending down the thighs. In severe cases, when complete obstruction takes place, the patient, unless promptly relieved, succumbs either to exhaustion or to peritonitis.

The diet, in cases of stricture of the rectum, should be the same as that recommended for ulceration of the bowels.



If the patient's digestion be in fairly good condition, marked benefit will be derived from the administration of full doses of potassium iodid, continued for a lengthy period; if, however, the digestive apparatus is below par, it will be more advantageous to reserve its diminished strength for the assimilation of nourishing food, and for the reception of such remedies as may assist digestion. For this condition the most favorable results will be obtained by the use of hypodermic injections of  $\frac{1}{10}$  cc. of a 30 per cent. solution of gray oil, to be administered once a week.

If the stricture be sufficiently patulous to permit the insertion of a small-sized rubber rectal tube, an injection of about a quart of warm boric-acid solution should be introduced into the bowel once a day. This will wash the intestine, and carry away whatever fecal matter may be lodged above the stricture. The introduction of the rectal tube may be facilitated by a preparatory injection of a syringe of sweet oil. When constipation exists, associated with flatulence, a combination composed of the following ingredients is recommended:

Beta naphthol.....	36 grains.
Chloroform.....	2 fluidrams.
Castor oil.....	12 "
Spirit of peppermint.....	32 drops.
Simple sirup, enough to make.....	6 fluidounces.
	Mix.

Dose : One tablespoonful when required.

When this condition pertains, much benefit is derived from the administration of sweet oil internally, provided the organs of digestion are in condition to permit the use of the remedy. A tablespoonful of sweet oil given three times daily, after meals, serves to lubricate the intestinal tube, and makes the passage of fecal matter easier, and markedly less painful.

In 4 cases, in which gradual dilatation was employed, together with the administration of 20 grains of potassium iodid, three times daily for a period of 4 months, all traces of the obstruction entirely disappeared. The local treatment embraces dilatation by means of the bougie, linear proctotomy, lumbar colotomy, and resection of the rectum by the method suggested by Kraske.

Gradual dilatation is by far the safest and most satisfactory mode of treatment, when

it can be advantageously employed. Care must be observed not to make dilatation too rapidly; the method pursued by me is to begin with an ordinary rubber bougie not larger than a No. 35 French; if the introduction is not accompanied by pain the tube is to be left *in situ* for the space of ten minutes and then withdrawn. The tube is to be gradually increased in bulk until a medium-sized rectal bougie can be readily passed.

In some cases in which I found it difficult, at first, to insert a small-sized rubber urethral catheter I have, by gradually increasing the size of the instrument, sufficiently dilated the intestinal tube to be enabled to pass a full-sized rectal bougie. Great care must be exerted to guard against rupturing the bowel, or tearing the stricture. Two cases have fallen under my observation in which death followed the violent stretching of strictures of the rectum.

In annular strictures situated in the vicinity of the margin of the sphincter much time will be saved by resorting to linear proctotomy; especially is this indicated when the stricture is of small caliber and non-dilatable. This operation I have performed on several occasions, and always with beneficial results.

In tubular strictures associated with abscesses and sinuses and with marked obstruction, lumbar colotomy, as a rule, is the operation to be employed, and should be followed, if the condition of the patient improve, by a re-section of the rectum by the method suggested by Kraske.

These strictures will occasionally arise without previous ulcerations. Such strictures are due to contraction of gummata deposited in the submucous tissue of the bowel. I have, at this time, a patient affected in this manner under my care at the Jefferson Hospital. The condition is rare, but yields readily to the administration of potassium iodid in full doses, and to gradual dilatation.

When the stricture follows an extensive ulceration of the bowel, it is very apt to re-contract, even after thorough dilatation; the patient should be fully informed on this point, and instructed to employ the rectal bougie when contraction is threatened. The nodular strictures due to the contraction of deposits of gummatus matter in the submucous tissue, yield readily to specific treatment, and, as a rule, they do not recur after having been absorbed.

The benign stricture is frequently accompanied by spasmodic contraction, so persistent as to interfere with digital exploration,

but it may be sufficiently controlled by an anesthetic to readily enable an examination by the finger.

## THE LOCAL TREATMENT OF CUTANEOUS SYPHILIS.

BY ARTHUR VAN HARLINGEN, M.D.

Read March 23, 1898.

THE older I grow the more convinced I am that attention to detail is the very essence of the successful treatment of syphilis. It is not, however, my intention to attempt to instruct the members of this Society in the general treatment of the disease. I hasten to disclaim any such unnecessary object. My humbler aim is to say a few words from the standpoint of a dermatologist on the local management of some of the cutaneous manifestations of the affection.

In the first place, I am impressed by the fact that the syphilitic disease is a local as well as a general affection. During the period of incubation, local treatment, excepting of the initial lesion, is impossible. So soon, however, as the general eruption breaks out we should at once get the skin in as healthy a condition as possible by means of frequent bathing, with disinfectant and antiseptic soaps, and we should, at the same time, be on the lookout for the particular thickened moist patches, known, when they occur in the mouth, as mucous patches, but which are liable to be found about the anus, on the adjacent surfaces of the scrotum, and thigh and, in fact, wherever warmth and moisture favor the maceration of the epidermis.

There are several plans by which we may diminish the virulence of these mucous patches and at the same time hasten their cure. I need hardly tell you that these early moist lesions of syphilis are well worth our earnest attention, for they form a more frequent medium of contagion, especially among the innocent, and in what may be called "family syphilis," than the initial lesion itself.

An indispensable preliminary to all ap-

plications is a thorough cleansing of the parts, and this is best accomplished by means of hot water and some medicated antiseptic soap. The mercury bichlorid soap is perhaps the best. Its medical virtues are slight, but it is an excellent preliminary to more active treatment.

After thorough cleansing of all the moist and discharging lesions, those on the external skin are best treated at this stage by solutions of silver nitrate. Such solutions are preferable to the solid stick, which comes so convenient to the doctor's hand in such cases, but which is too apt to have a destructive rather than a curative effect. The strength of the solution should be from 5 to 50 per cent., and it should be applied by a little wad of cotton to the previously dried surface of the moist patch. We thus form a protective coating of coagulated albumen, which at the same time favors the cure of the lesion and renders it for the time being innocuous to others. After this a little dithymol diiodid finely powdered or some similar substance may be dusted over the lesions to absorb any further moisture.

When mucous patches exist upon the lips, tongue, buccal mucous membrane or tonsils, these demand constant attention and local treatment, both for the protection of the patient and even more especially for the protection of others. The silver nitrate solution or stick is not strong enough for these lesions. They are to be dried carefully with a bit of rag, but not with absorbent cotton, which sticks all about the mouth and gives the patient unnecessary annoyance. As each individual lesion is dried, a solution of mercury nitrate, made by mixing one part of the "liquor hydrargyri ni-

tratis" with from ten to twenty parts of distilled water, is lightly brushed over the surface. Where there are mucous patches about the roots of the teeth and on the gums, hydrogen dioxid should be freely used for cleansing purposes. Indeed, in all syphilitic lesions of the mouth extreme cleanliness must be enjoined. When we find a mouth filled with decayed and broken teeth, the interstices of which contain the decaying food of one or more meals, we have a condition of things highly unfavorable to the cure of mucous patches, and when in addition the patient habitually uses tobacco, we may give an unfavorable prognosis as to entire or at least speedy cure. Under such circumstances I have known patients to carry about these contagious mouth-lesions for years, during which they remained a menace to all around them.

Those lesions which may be said to belong to the middle period of syphilitic development, the crusts on the scalp, the band of papules encircling the forehead just beyond the line of hair, the palmar and plantar lesions, etc., are sometimes left to themselves, so far as local treatment goes, but this, I think, is a mistake. The disfigurement which they cause and their highly characteristic appearance are apt to cause patients to manifest extreme anxiety to have all such traces of disease removed with the utmost rapidity. Ointments containing mercurial salts, as the oleate, white precipitate or mercury nitrate, in various strengths, may be used on these lesions with great advantage. The old-fashioned mercurial ointment is unsightly and disagreeable to use, while it is no more efficient than the other ointments. When cosmetic effect is desirable, considerable help may be gained by applications of alcoholic solutions of 1 to 10 per cent. mercury bichlorid, or solutions of the same strength in collodion. When weak, such solutions may be trusted in the hands of intelligent patients, and will be found to aid greatly in the treatment of the obstinate ringed eruptions of the middle period of syphilis.

In the earlier period of generalized syphilis, we employ local treatment to assist in the cure, and also to prevent the spread of the disease.

In the middle period we use the same treatment to cure, and also for its cosmetic effect to remove in the shortest possible time the unsightly blemishes caused by the eruption.

In the later period of syphilis, however, that stage formerly known as the "tertiary period," we employ local treatment, not merely as an adjuvant, but also in many cases as an active agent in the cure of the various manifestations. For, it is a characteristic of these later manifestations, not only to take on the appearance and to simulate closely various non-syphilitic eruptions, but also to assume at times the nature of erythema, of inflammation, of abscess, of suppurations and ulcers, and even of malignant growths. The transformation of syphilitic eruptions into epitheliomata is by no means excessively rare, and late syphilitic eruptions are said by some foreign writers, in rare instances, to have become transformed into lupus. There is, therefore, plenty of opportunity for local treatment in the late lesions of syphilis.

When pain, heat and the other accompaniments of inflammation are found in connection with an eruption which is manifestly of a syphilitic nature, it is next to useless to attack the disease by anti-syphilitic remedies alone; these will frequently do no more than aggravate the disease. It is better to postpone all specific treatment and use sedative lotions and mild but appropriate general treatment at first, and then, when the acute symptoms shall have passed away, we can return to specific treatment with a far better hope of success.

These remarks refer primarily to the non-suppurative lesions, but when we have suppurative syphilitic lesions a new element enters into the problem of treatment which must be seriously reckoned with if we would hope for rapid and satisfactory results. It should never be forgotten that suppuration and pus-formation with the self-poisoning which follows should be combated from the beginning. Abscesses should be opened and cleansed at once, rupial and other crusts and debris gotten rid of, ulcers kept thoroughly cleansed, and as nearly complete antisepsis as possible carried out.

With these principles in mind, and with that attention to detail which is nowhere more important than in the management of syphilitic eruptions, we may engage in the treatment of this disease with the certainty of quicker and more satisfactory results than when a routine administration of mercury and potassium iodid is alone relied upon to effect a cure.

## SOME PRACTICAL POINTS IN THE TREATMENT OF LATE CUTANEOUS SYPHILIS.

BY M. B. HARTZELL, M.D.

Read March 23, 1898. •

IN many cases much smaller doses of the iodids, especially of the potassium iodid, than those commonly recommended are promptly effective in causing the disappearance of the late eruptions of syphilis. So small a dose as a single grain will in some cases remove the tubercular syphilide. These small doses are especially to be commended, because they act upon the cutaneous lesions without that derangement of the stomach which often follows the use of an ordinary dose. The favorable remedial effects of small doses are shown by the cases that have been briefly related. In those cases in which

iodids administered by the mouth are not tolerated by the stomach in any dose, they may be employed satisfactorily by enema, as shown by a case under the writer's care.

In exceptional cases the iodids are without therapeutic effect in tertiary syphilis. This should be remembered when endeavoring to make a diagnosis in doubtful cases *ex juvantibus*.

As a local application in ulcerating syphilides, mercurial plaster is much more convenient and cleanly than the various ointments commonly employed, and is quite as effective.

### DISCUSSION.

DR. EDWARD MARTIN was impressed by what seemed to him the unusual number of cases treated by Dr. Horwitz, and said he had come to regard specific ulceration of the rectum as rather rare in these days. He had never seen more than six cases, and when Dr. Horwitz detailed his large experience, he opened Dr. Martin's eyes to the fact that a surgeon is apt to run into a class of cases, and that another surgeon, not meeting the cases himself, is liable to get an erroneous idea concerning their frequency. Stricture of the rectum from syphilis does not necessarily imply ulceration. There are certain forms of infiltration, not breaking down, which undergo fibroid-degeneration, contract, and thus produce cicatricial narrowing.

The treatment of true stricture, excepting in the early stage of infiltration, has been unavailing in Dr. Martin's experience, in so far as the administration of drugs is con-

cerned. He believes the treatment of syphilitic lesions is futile when scar-tissue has formed. He believes neither mercury nor potassium iodid will have any influence on old cicatrices, so that the constitutional treatment of the rectal strictures and of the old rectal ulcers is unavailing. The main effect of the general treatment is to diminish the already enfeebled resistance to this disease. With the local treatment described by Dr. Horwitz, most physicians will probably be in accord in general terms. Dr. Martin's own preference has always been, in mucous-membrane lesions, to employ some salt of silver, either silver nitrate, or, decidedly better, argonin or argentamin. As to the differential diagnosis between cancer of the rectum and ulcerating gumma, this, as Dr. Horwitz said, is extremely difficult to make. Very often the history of syphilis is wanting, and even if there be a history, it is not im-

possible for a cancer to attack pre-existing syphilitic ulcers. A characteristic sensation to touch, which has always seemed of value, is that of crumbling. The finger encounters a surface which presents about as much resistance as would wet sawdust. When that is present, he has always considered the probability very strong as to the malignant nature of the infiltration, and microscopic examination has nearly always confirmed that diagnosis.

The use of bougies for strictures, intermittently, at intervals of four or five days, and with a force that causes some bleeding, and tearing, accomplishes very little. The bougies Dr. Martin recommends in these cases are those of soft rubber; they can be very safely trusted in the hands of patients, and can be applied daily. This gentle, daily-repeated stretching has always seemed to him much more efficacious than that which is accomplished by violence, and at intervals of several days, or sometimes of a week or two.

The attention which Dr. Hartzell has called to the use of potassium iodid in small doses is extremely timely. The general tendency seems to have been to increase rather than diminish the dose. It is quite new to Dr. Martin, that these very minute doses will produce any effect whatever, and its rectal administration is a means all have neglected. He had always considered that the very essence of the treatment of syphilis, whether primary, secondary, or tertiary, was mercury, and that the iodids were simply to be regarded as helpers. The tendency has been to lay too much stress upon the administration of iodid in the tertiary stage and too little upon the continuance of mercury from the early to the late stage. The guide as to benefit of treatment is examination of the blood. He places reliance rather on the percentage of hemoglobin than on the number of the red cells, and thinks the weight of the patient is the simplest and surest way of judging as to the effect of treatment. If the weight remains stationary or increases, there is reason to believe that the treatment is beneficial. If there is steady, fairly rapid reduction in weight, the treatment should be changed, or even stopped. In administering mercury hypodermically, the urine should be examined first. Nearly all the cases of salivation which end fatally have had a diseased kidney, which was unable to elim-

inate the drug. By a previous examination of the kidney, the initial dose may be graded so that it will not be dangerous.

Dr. Van Harlingen's paper lead Dr. Martin to say that he had been in the habit of excising chancres as soon as diagnosed, and thinks it the rational treatment to pursue. All believe that syphilis is due to the effect of a microorganism. All believe that it gains its entrance at the seat of chancre, and it seems as rational to excise or remove the original focus as it is to excise a wound poisoned in any other way. The amount of poison in the system is lessened and not distributed, and in this way the violence of subsequent symptoms may be diminished. With regard to Dr. Van Harlingen's use of silver nitrate on moist papules, it has seemed to Dr. Martin that perhaps better results follow the use of the organic salts of silver. Such sores do better when they receive, as a preliminary spray, Dobell's solution, or some other alkaline wash, to remove the mucus, after which the silver salts or mercury may be applied. Some years ago, when the local use of heat and mercury was strongly commended in the treatment of syphilides, Dr. Martin subjected a number of patients to local treatment. One man, who had a general papular eruption, had his entire arm swathed in a cloth saturated with bichlorid 1: 4000, and about it were packed hot-water bags. The cloths were kept wet constantly, the other arm was also wrapped in wet cloths, but without mercury or heat, and at the end of 3 days absolutely no difference could be seen in the eruption of the two arms. Other patients had applied to the two sides of their bodies other contrasting methods of local treatment, but no difference between the areas thus treated was noted. Dr. Martin thinks a habit was made of applying mercury locally, and of giving it internally, and that the cure resulted mainly because of the internal treatment, and that the local treatment, although it helped some, was a placebo and a means of pleasantly occupying the patient himself.

The point to which Dr. Stelwagon alluded, as to the absence of early history, is one which will strike everyone who has much to do with the disease. Dr. Martin believes patients who fail to give a history are absolutely honest in their statements. It seems that physicians afflicted with syphilis are particularly liable to fail to trace their

trouble. In some cases it is undoubtedly a small lesion of the hand or fingers; in some cases no doubt it is a chancre in the mucous membrane of the mouth. In one case seen recently, the symptoms were in the early secondary stage, and there was total absence of any primary history. A careful examination showed chancre of the septum nasi. It is easy to imagine that a primary case may be mild and thus the patient fail to give the history of the initial lesion.

In regard to the choice of drugs, the popular treatment of to-day is the use of mercury protiodid given in the dose of gr.  $\frac{1}{3}$  three times a day. The exceptional treatment is that by hypodermic medication, mercuric chlorid gr.  $\frac{1}{4}$ , repeated as required. It is to be noted that protiodid is irritating to the gastrointestinal tract and particularly that when this irritation is started, the mercury is no longer absorbed. Mercury tannate is often to be preferred. Dr. Martin has lately had very good results, employing this medicament in the dose of a grain thrice daily. It seems to agree admirably, although it will not do so in all cases and, when it fails, resort may be had to the hypodermic treatment, or, the best treatment of all, inunction. In the later stages of syphilis there is often great difficulty in getting the patient to tolerate either mercury or the iodid preparations. Thus iodid preparations have often resulted in such intolerance that Dr. Martin had prepared by Parke, Davis & Co. a preparation termed the elixir of iodo-tannate of mercury, which is an extremely serviceable form of mixed treatment. In the last few months he has constantly given it to patients who could not take iodids in any form, and their general health has steadily gained. The pure iodid is also serviceable, in proper mixture. When patients could not take the iodids, material help in the treatment of tertiary syphilis has been afforded by sirup of hydriodic acid. When there is an idiosyncrasy against potassium iodid, the hydriodic acid will sometimes render priceless service. It is given by the teaspoonful, three to six times daily. It will relieve headaches and cure ulcerative lesions when the iodids are futile.

DR. T. R. NEILSON said that he, too, had been led to believe the rectum to be rather an unusual seat for manifestations of syphilis. He had seen many cases of syphilis; but probably less than a dozen in

which the rectum was attacked by the disease. These cases have all been late lesions, and in persons advanced in life, with one exception, that of a young woman.

Dr. Horwitz's remarks regarding the topical treatment coincided with that employed by Dr. Neilson himself. He thought Dr. Martin's words regarding the use of the bougie very pertinent, and that they are verified in practice. He believes that the frequent and the gentle use of the bougie in stricture of the rectum of whatever variety is what should be aimed at, not the interrupted or intermittent use. It is always to be remembered that, no matter how soft the material of which the bougie is made, there is a very decided risk in passing a bougie and those who make use of it should be cautious in inserting it or intrusting its insertion to unskillful hands. Medication in stricture of the rectum which is due to cicatricial contraction is, in Dr. Neilson's opinion, of little use. He does not believe that potassium iodid has any effect. If stricture is due to gummatous deposit in the submucous tissue, then we have a field in which potassium iodid or any of the iodids is distinctly indicated.

Dr. Hartzell's paper calls attention to a very important point, the judicious dosage with potassium iodid. Dr. Neilson long ago found that it is not necessary to use the regular doses that are printed in all prescription books and which are regarded as habitual doses of potassium iodid, for often smaller doses accomplish as much good. He has under his care, at present, a man who could not stand potassium iodid in 5-grain doses three times a day, but who bore it well when reduced to 2-grain doses three times a day. Later, thinking it would be wise to push the drug a little further, iodism was produced. The thought that perhaps the patient was particularly susceptible to this salt caused the substitution of sodium iodid. When this was increased to 7 or 8 grains a day the same symptoms were manifested. Then the sodium iodid was combined with sodium bromid, and from that time there was no further trouble, the patient taking 8 grains each day without difficulty. On the other hand, when it is found that small doses will not answer, one must go to the opposite extreme. Dr. Neilson had at times prescribed 2, 3, 4 drams per day of potassium iodid and produced no

untoward effects at all. The largest dosage he ever employed was six drams a day for about a month. This was for a gumma of the larynx. He considered Dr. Van Harlingen's paper important because it attaches importance to detail in the treatment of syphilis. The little things are often inadvertently overlooked. Very often patients suffering from syphilis are met who bathe very rarely. In syphilis, bathing and attention to hygiene of the skin is of the utmost importance, and Dr. Neilson often advised a Turkish or a steam bath to promote cutaneous action.

Regarding Dr. Van Harlingen's use of silver nitrate for moist papules on the skin, Dr. Neilson prefers calomel, advocating also spraying with hydrogen dioxide and washing with bichlorid solution. For mucous patches in the mouth, and especially those which appear late in secondary syphilis, when there is a loss of substance in lesions which begin in a hyperplastic state, he always uses the acid mercury nitrate in the strength suggested by Dr. Van Harlingen. Patients should rinse the mouth several times a day as a routine proceeding with potassium chlorate in a saturated solution. This may be used several times daily for prophylactic action.

Dr. Neilson agreed with Dr. Martin's statement regarding the variable tolerance of individuals to the salts of mercury. His preference is for the yellow mercury iodid in doses which will average gr.  $\frac{1}{3}$  three times a day. The variation in the magnitude of the dose tolerated by different individuals is very striking and has a great deal to do with the control of the disease. Treatment occasionally must be suspended because of gastro-intestinal irritation produced by the salt. Dr. Neilson had recently two cases, neither of which could take the mercury protiodid in any dose without immediately having their stomach and bowels deranged, and their gums made sore. In both these cases he found that the mercuric chlorid in triturate form was very well borne. When none of the mercury salts are tolerated when given by the mouth, Dr. Neilson prefers the inunction with blue ointment and has used this form of treatment in a great many cases. His experience with hypodermic medication has been limited. He does not express himself strongly in its favor, and has observed that

a patient can be treated with inunctions who, after having one or two hypodermic injections refuses that manner of treatment. The results obtained with inunctions of 1½ drams of mercurial ointment per day have been satisfactory and they have generally controlled the lesions in two or three or four weeks. After that, Dr. Neilson found that he could return to dosage by the mouth and continue it without any difficulty whatever.

DR. T. S. K. MORTON's experience in syphilitic strictures of the rectum led him to say that these cases are not so rare in the dispensaries. In the Pennsylvania Hospital it could not be said that syphilitic diseases of the rectum are unusual. In private practice they are rare. At the Pennsylvania Hospital, which drains the slums of this city, these lesions probably follow incompletely treated syphilis, and secondary lesions are far from common. They are most common in women and particularly in colored women. Dr. Morton has seen a far greater proportion in the colored race than among whites. He endorsed what Dr. Horwitz said as to the treatment of this affection, and inclined to the less radical methods. He has once or twice done a linear proctotomy with benefit. Dilatation is certainly the most efficient mechanical treatment. He uses a soft rubber bougie, and believes that one of a caliber that comfortably fits the stricture without exciting reflex spasm has accomplished more for his patients than when a tight-fitting bougie has been forced through the diseased portion of the bowel. He thinks that dilatation should be kept up regularly for a very long time, say twice or three times a week at most. He considers that too frequent and too forcible dilatation by bougie produces ulceration or maintains that which may have been already present. He is convinced that this affection does not, as a rule, arise from a primary lesion, and has known very serious reflections to be cast upon innocent persons by the belief that such ulcerations and constrictions were the result of primary lesions, whereas they are usually the consequence of tertiary or gummatous degeneration.

As to diagnosis, it is difficult. In young people it is not so difficult to make a diagnosis from epithelioma. In patients of later life he has, at times, been puzzled to make diagnosis between cancer and syphilitic disease of the rectum. One or two cases

have proved to be tertiary syphiloma degenerating into carcinoma. His impression is that syphilitic growths of the character under discussion finally degenerate into carcinoma. The dangers of dilatation, he thinks, cannot be too strongly insisted upon. He knows of two cases that have been distinctly killed by resident physicians injudiciously using dilatation. He relieves pain and secures moderate antisepsis by three grain iodoform suppositories night and morning. These are sometimes combined with opium and belladonna.

In regard to syphilis itself he thinks that the disease is becoming much milder in type either from treatment, or because the community is becoming immune. A missionary recently returned from Africa informed him that syphilis runs riot there and that while its virulency yields to treatment, it does so much less readily than in dispensary cases in this country. So far as general treatment of syphilis goes, it is never out of place to emphasize the necessity of avoiding treatment until secondary lesions appear. As soon as secondaries appear in some form, as when a roseolous rash comes out, then the sheet-anchor of the treatment is mercurial inunctions. Dr. Morton begins with mercurial inunctions and internal treatment until the patient is decidedly mercurialised. Then, if symptoms are under control, he suspends the ointment. When he begins treating syphilis he employs the mercury protiodid and it is generally efficient. When this drug is not tolerated by the digestion he follows the custom of that safe adviser, Mr. Jonathan Hutchinson, and uses the gray powder. In the later lesions of syphilis he has noted the point made by Dr. Hartzell as to the beneficial effect of small doses of potassium iodid. The discovery of this was accidental, through patients being unable to take larger doses. He has also used very large doses of potassium iodid without observable bad effect upon the gastro-intestinal tract or kidneys. For ulcerative skin lesions he believes silver nitrate or the dilute copper washes are unequalled.

To attempt to state the limit of the period of contagiousness of syphilis, Dr. Morton considers futile. Two years ago he had an instance of the late contagiousness of syphilis in a person about whom he thought he knew everything. This man inoculated his

wife from a mucous patch on his tongue four years and three months after his primary sore. Dr. Morton had treated him throughout the entire period. That instance had caused the speaker to make his limit for marriage at least five years after the initial lesion. The treatment of syphilis in children, particularly the congenital form, has presented a great deal of difficulty. He knows nothing more difficult at times to master. Hydriodic acid has proved valuable. He has given it in many cases with good effect, also ferruginous tonics, codliver oil, gray powder and inunctions. Copper seems to be the best remedy for local lesions. Of the remote effects of congenital syphilis he has had many very interesting examples. A young man sufficiently intelligent to rule out the possibility of syphilis during his mature existence, presented several years ago a periostitis of the fibula. This subsequently sloughed in the typical manner of late syphilis and a section of tibia was excised. The trouble recurred and another portion of bone was removed. Recurrence in the lower end of the femur took place a few months later and a low amputation of the thigh was done. Necrosis recurred in the stump, and amputation of the hip-joint was performed last spring. He came back this September with similar necrosis of the ileum on the same side, and died of sepsis. He was of the Hebrew race, and a post-mortem was unobtainable. No treatment that Dr. Morton or several other surgeons could advise had the slightest effect upon the condition. He could not take iodid in any form or dose.

Another case, a woman of 25 years, the mother of an apparently healthy three-year-old child, came with a sore upon the nose. It looked like epithelioma and spread in spite of varied treatment, including several excisions, cautery, etc. It spread to the bones of the nose, then through the nose and finally to the brain and killed the patient in 18 months. All who saw the case diagnosed congenital syphilis. This, however, was strenuously denied, but when the sufferer was dead her mother confessed to having had the disease in early life.

On the other hand, Dr. Morton had known men to have virulent syphilis and to bring up, without any signs of this disease, families of exceedingly healthy children. The treatment of certain congenital forms of



syphilis is still a field for investigation. Not enough is known about it, and the results are far from satisfactory. Concerning extra-genital chancre, he did not know whether he had seen more than his share of this method of infection, but was able to think of nine cases. Five he had seen within the past year, two of these being in physicians. Three of the nine were of the lip; one was of the mouth, in an infant, and from a syphilitic wet-nurse; one of the tonsil; one of the finger; one of the anus; one of the side of the nose; one of the nipple. This simply emphasizes that the public is unaware, to a large extent, of the great danger of contagion. The average person is exceedingly careless in handling utensils, money, in osculating, etc. Though this is practically the only contagious disease of which physicians are afraid, yet he believes that medical men are not sufficiently definite and emphatic in talking to their patients who have acquired the disease or in warning the public of its fearful dangers. He finds very few of the laity who know anything about the possibility of non-venereal contagion in syphilis. He would also like to emphasize the necessity of excessive care to avoid contagion upon the part of physicians who come in contact with syphilitic patients. He knows of six physicians suffering from this malady at the present time who have acquired it, by inoculation of the fingers, in the course of practice.

DR. H. M. CHRISTIAN professed himself as hardly competent to discuss the subject of Dr. Horwitz's paper, his own experience in such cases having been limited to two cases seen in dispensary practice. The treatment advised by Dr. Horwitz was employed, but the results were not very satisfactory and the patients disappeared.

As regards the general treatment of syphilis, Dr. Christian believes that the keynote of success lies in treating the patient as well as the disease. We should bear in mind that mercury and potassium iodid are not the only drugs to be employed. Codliver oil, iron and whisky he had found to be as valuable as mercury, particularly in cases of precocious malignant syphilis.

In ordinary cases of secondary syphilis Dr. Christian is in the habit of employing but two forms of treatment, *i. e.*, the use of the protiodid of mercury internally, or mercurial inunctions. He finds that the

secondary lesions generally yield to one or the other of these methods.

Dr. Christian was interested in Dr. Hartzell's remarks regarding the administration of minute doses of potassium iodid in the treatment of tertiary lesions, and thinks that the fact that many of these cases occur in women and are not ulcerating, may be one reason why small doses answer so well.

Dr. Christian feels assured of the fact that small doses of potassium iodid would have little or no effect upon the extensive ulcerating tubercular syphilodermata seen in venereal dispensary practice.

DR. W. JOSEPH HEARN holds that the initial lesion does not produce any contraction or ulceration. The exudate is absorbed. A chancre of the urethra does not produce a stricture. Every case of syphilitic stricture of the rectum is caused by gumma and not by the initial lesion. A surgical operation is the only remedy to use. Dr. Levis said that mercury cured syphilis and the iodids cured the effect of syphilis. Dr. Hearn rarely gives potassium iodid when he can control the patient. It is tertiary syphilis that he treats. If a patient follows up his hygienic as well as mercurial treatment, if he takes small doses of mercury and continues them for two or three years he need not fear, that is, if he is temperate. Drunkards are notoriously hard to treat, and whenever alcoholism and syphilis are combined the case is a bad one, and will probably develop tertiary syphilis. Dr. Hearn rarely gives anything but mercury. He uses protiodid, and when cramps ensue then advises mercury and chalk, or when a patient is anxious to get rid of a secondary lesion recourse is had to inunctions.

Dr. Hearn never gives large doses of iodid. He has always managed his cases with 10 to 20 grains three times a day. A great many women will not bear the iodids at all. He uses sodium iodid and not that of potassium. He can imagine that there might be cases of brain syphilis in which he would wish to give the larger doses. It is important to know when this disease is secondary and when tertiary. There is an easy rule. As long as it is confined to the skin it is secondary, as soon as it goes below the skin it is tertiary. As soon as the symptoms show themselves beneath the skin, in the muscles, in the bones, or the internal

organs, then it is tertiary. Dr. Hearn has a patient who thought he had contracted syphilis in China three and a half months before presenting himself for observation, but this man had at that time tertiary syphilis. It yielded slowly to baths and the hygienic treatment that everybody suggests. Dr. Hearn thinks it is the hygienic treatment which makes syphilis less malignant than it was formerly. The hygienic conditions are better now and so syphilis has ceased to be the terror of former years.

DR. A. E. ROUSSEL said that certain French syphilographers held that mild secondary lesions, particularly skin lesions, are more prone to be followed by severe tertiary lesions than when the secondary skin lesions are more pronounced. Dr. Roussel thinks these cases with slight secondary lesions may pass from the observation of the practitioner and fail to continue treatment for a sufficiently long period of time. Speaking of the use of potassium iodid by the bowel, Dr. Roussel referred to a case of malignant syphilis he had reported to the Society. Ten weeks after the appearance of chancre, gummatous ulceration attacked the hard palate, and notwithstanding all forms of treatment, fumigations, hypodermic injections, and irrigations by the bowel, symptoms of salivation were invariably produced in greater or less extent, and the patient died within the year. It is interesting to note that even potassium iodid, when administered by the bowel, may continue to maintain irritability of the stomach, as mercury given by fumigation may cause salivation. Dr. Roussel was glad to hear allusions made to treatment of the mouth in syphilitics. He thinks insufficient attention is paid to the mouth by the general practitioner, and believes women to bear mercury better than men because their teeth and buccal membranes are in better condition. A patient with neglected teeth will show symptoms of salivation under comparatively small doses of mercury. Dr. Martin's statement regarding the excision of chancre surprised Dr. Roussel. He thought that many experiments in this direction were barren of result, and he recalled a case of his own. A man noted a secondary rash on the body of his mistress and brought her to Dr. Roussel. The case was clearly syphilitic. The man watched eagerly for manifestations in his own person; within a few hours after the appearance of

a sore, it was reported to Dr. Roussel, who thought the case favorable for excision, and excised the parts thoroughly. After this no treatment of any kind was given until the appearance of secondary symptoms. The case proved as intractable as any in his experience. It takes at least ten days or two weeks before chancre can be said to exist. It seems to be utterly impossible until induration occurs to state the existence of chancre. If it is excised previous to induration, the patient may remain for the rest of his existence under the impression that he suffered from the initial lesion of syphilis and may be looking forward to some more pronounced symptoms.

Dr. Christian's recommendation, that occasionally tonics be employed to the exclusion of all specific treatment, Dr. Roussel thinks is in some cases an absolute necessity. When the patient has been over-drugged he would go a step further and say cessation of all treatment. He has seen phagedenic sores improve when sent to the seashore or mountain and all other treatment stopped. This is of much importance. As a guide to treatment the estimation of hemoglobin is probably less precise than the corpuscular count, because the ratio between the two occasionally varies.

DR. J. MADISON TAYLOR was disappointed that the specialists engaged in the discussion had not dwelt upon syphilitic affections of the brain and spinal cord. Though the question of inunction, when mentioned, is disposed of as "inunction," there are a great many ways of applying them—good, bad and indifferent. They sometimes rescue life and overcome conditions of central and nervous disability as nothing else can. A friend of Dr. Taylor's, who had exhausted the talent of this city in seeking relief for a condition of very protracted syphilis, went abroad, and was cured by Pagenstecker, who used inunctions of mercury. The patient was directed to wash certain portions of his limbs or arms thoroughly with soap and water, next he was directed to put upon that part a certain dose of the ointment and that was rubbed in by means of a little glass rod. The mercury went in and the part was washed off and that was the end of it. This method has served admirably in syphilis of the brain and spinal cord. Those who want to get a prompt and rapid effect should try this method. It seems

about the only means of getting the mercury in.

DR. MATTHEW WOODS has observed that there are physicians who do not care to treat syphilis, on the ground that "it is not respectable," and who seem to consider it a low acquaintance, with whom they thought it best not to be too familiar. Yet there is no disease of which a profound knowledge is of more importance to the general practitioner than this one, because men, the active ones in contracting the disease, consult specialists, while their wives and children in their helplessness resort to the family physician. Thus syphilographers usually see but one member of the family, while those in general practice see the others. If therefore the family physician is indifferent or incapable, the first and second stages of the disorder so comparatively insignificant—in women—in the production of specific symptoms, may escape his notice, attain the tertiary stage, and thus be transmitted from one generation to another, simply because the majority of them do not receive proper care. Dr. Woods spoke of the importance of the general practitioner knowing more about the disease and giving more attention to its differential diagnosis. In regard to its duration, he told of one of the great syphilographers of Sweden, who when asked by a syphilitic patient if he could be entirely cured, replied: "No, you will have the disease as long as you live, and your ghost will have it after you are dead." Dr. Woods emphasized that it would be well to guard patients from having syphilis after they are dead, that is—in their offspring. This result can be accomplished by giving better attention to the women and children afflicted with the frightful disorder, so as to secure up-to-date results, namely, complete eradication in eighteen months.

DR. RACHEL SKIDELSKY, in relation to the nervous manifestations of syphilis, cited the case of one of her patients, a woman past 50 years, a widow some years, and suffering for six years from convulsions. The patient was put on bromids, and within a week exhibited a white eruption upon her forehead, hands and arms. At first Dr. Skidelsky thought the drug had caused the eruption, but on examining the lesions she found they were unmistakably syphilitic. The patient was given twelve doses of  $\frac{1}{8}$  of a grain of calomel at intervals of one hour. This was

followed by sodium phosphate in the morning. Treatment by potassium iodid, 10 grains, three times daily, was instituted and calomel was given once a week. Inunctions of mercury were also employed. The eruption began to improve within thirty-six hours after institution of specific treatment. The case has been under treatment about four months. Prior to that convulsions occurred every two months. The patient has had but one attack since treatment began, and then there was no loss of consciousness. This epilepsy seems to have been cured by specific treatment.

DR. S. COLES recommends inunctions of mercurial ointment prepared with lanolin as a base instead of with lard and suet, as is in the official preparation; the ointment thus made is more readily absorbed and less bulky than a mixture of the official ointment and lanolin, and gives quicker and better results.

DR. HORWITZ stated that his extensive experience with a rare form of syphilis was due to the fact that the Genito-Urinary and Venereal Department of the Jefferson Hospital was the largest in the city, if not in the country; that there was an average attendance in the Out-department of one hundred cases daily. During the past year, four cases of stricture of the rectum, due to syphilis, had occurred in his service at the Jefferson Hospital, and four in the Philadelphia Hospital; these facts would lead him to believe that the condition was not so unusual as had been supposed by some of the gentlemen who had discussed the paper.

In regard to the employment of small doses of potassium iodid, for the cure of the late lesions of syphilis, Dr. Horwitz stated that he had not been enabled to obtain as satisfactory results as Dr. Hartzell. He let the patient be the guide for the size of the dose of the remedy administered. His rule was to start with a small dose of the iodid and gradually increase it until the symptoms were ameliorated; it was then gradually reduced until a medium-sized dose was reached, which was continued for some time, provided it continued to control the symptoms; if not, it was gradually increased until the symptoms abated.

His experience with the remedy, given by rectal injection, was similar to that recounted by Dr. Hartzell. He found the rectal administration of the iodids of great service in

those who were debilitated, whose digestive tract was out of order, and whose stomach was needed for the assimilation of wholesome, nourishing food.

In reference to the point made by Dr. Martin, that it was dangerous to employ mercury hypodermically in the treatment of syphilis associated with disease of the kidney, he was fully in accord. The reason that this point was not discussed in the paper was because the article dealt with stricture of the rectum and not hypodermic medication in the treatment of syphilis. The hypodermic method was only mentioned as the best method to employ under certain conditions of the gastro-intestinal tract. It was presumed that anyone familiar with the subject would be aware that a chronic disease of the kidneys was a counterindication for its employment.

Dr. Horwitz had not experienced the difficulty in getting patients to submit to the hypodermic method of treatment, alluded to by Dr. Neilson. On the contrary, both hospital and private patients frequently returned when a relapse occurred and requested to have the hypodermic method of treatment repeated.

A large experience with this method of treatment had convinced him that it could be employed with advantage in those cases in which time was an object; in obstinate relapsing syphilis when other methods of treatment had failed to give relief; and in eruptions that had proved rebellious to treatment. It will not abort the disease, as has been claimed by some writers, and it should not be employed as a routine method of treatment. He stated that a large experience with the method had convinced him that in suitable cases, when properly employed, it is

one of the most reliable methods that the profession possesses wherewith to fight the disease.

As to the excision of a chancre that is accompanied by no involvement of lymphatic glands and is seen within three or four days after its appearance, it might be regarded as a local lesion and should be excised, if it is located in a position favorable to removal. In an extended experience with the excision of the initial lesion of syphilis, he had found in every instance the result unsuccessful. It was true that in many instances the symptoms were delayed, and were, in every case, mild; but it must be recollected that mild syphilis is the rule at the present time and not the exception. In one instance in which a tear of the frenum was excised within two hours after it was received, a chancre developed which, in the course of time, was followed by secondary syphilis.

Dr. Horwitz thought, for the reasons given by Dr. Roussel, that the only reliable method of determining the effect of mercury on the system was to make a blood-count, which should always be done in those patients who were losing weight or becoming anemic, under specific treatment.

Dr. M. B. HARTZELL replied to Dr. Christian, that in many cases small doses of the iodids are quite as efficient as large doses, but in many other cases large doses only will produce the effect desired. Apropos of what had been said by Dr. Martin, Dr. Hartzell wished to add that in old lesions of the palm, local treatment is almost a necessity. There are cases of tertiary syphilis in which the action of the potassium iodid alone, or of some other iodid, is little short of marvelous. The tubercular patch simply melts away in the course of a week.

## A CASE OF PROGRESSIVE MUSCULAR DYSTROPHY.

BY AUGUSTUS A. ESHNER, M.D.

Read April 13, 1898.

THROUGH the kindness of Dr. S. Weir Mitchell I am permitted to report the following case of progressive muscular dystrophy and to present the patient, who applied for treatment at his clinic at the Orthopedic Hospital and Infirmary for Nervous Diseases, on April 1, 1898, when the following notes were made: The child is one of seven children of healthy parents, all born without difficulty. Two brothers, 10 and 2 years old, respectively, and two sisters, 16 and 11 years old, respectively, are living and well. One sister died at the age of 5½ years, after an attack of mumps attended with croup, and it is thought with the rupture of a bloodvessel. One brother died at the age of 13½ years; it is believed that he also suffered from some disorder akin to the patient's, but the immediate cause of death is not clearly ascertainable. The symptoms appeared at the age of 7 years and were gradually progressive to the point of utter helplessness. A maternal uncle suffered from paralysis in consequence of a spinal injury; and a paternal aunt had chorea at the age of 15.

The patient is a white boy, 7½ years old, born in Philadelphia, who, while at no time robust, has never been ill, except for an attack of measles at 4, followed by chicken-pox. Some three or four months ago, a little difficulty in walking was noticed, with some awkwardness in raising the feet from the ground. This has increased steadily until now the child is scarcely able to ascend stairs, and he has a tendency to trip and fall, as well as general unsteadiness. There has been, beside, moderate bodily wasting, although enlargement and firmness of the calves have been noticed for eight months. The mental state is excellent and function in general is well performed.

In walking, the patient displays the characteristic flail-like foot-drop, due to weakness of the anterior muscles of the leg, with, perhaps, some shortening of the posterior; the gait is waddling and typically duck-like. In standing, the plantar arch is obliterated and the station is a little uncertain. On arising from the recumbent posture the patient climbs up his legs and thighs in a most typical manner. The calves are enlarged, firmly elastic, and of the consistence of fat and fibrous tissue rather than of muscle. The deltoids also present in slight degree a similar change in consistence. Elsewhere, muscular development and deposit of fat are deficient. The scapulæ are slightly alar and the dorsal spine is curved slightly toward the left. The child is, and, it is said, always has been pallid. The superficial reflexes are everywhere active; the deep reflexes deficient. An occasional knee-jerk can be elicited on striking the patellar tendon. General sensibility is preserved. The grasp of the hands is exceedingly feeble, scarcely sufficient to make an impression on the dynamometer. The head is rather large and square. There is no beading of the ribs or enlargement of the epiphyses of the long bones. The hair of the head is a little coarse in texture and in places somewhat thinned. The extremities, and especially the lower, are often cold, subjectively and objectively. The sphincters are under perfect control.

The largest circumference of each calf measures 21 cm.; that of the thighs, 5 cm. below the groin, 25 cm.; that of the arm in the mid-humeral region, 12.5 cm. on the right, 13 cm. on the left; that of the forearms, a short distance below the flexure of the elbow, 12.75 cm. Electric examination, kindly made by Dr. J. H. W. Rhein, shows

enfeebled response to faradic stimulation in the scapular muscles, the extensors and flexors of the right arm, the triceps and the extensors of the left, and the left rectus and biceps femoris. In the remaining muscles the response is good or fair. Nerve-transmission also is good.

In treatment a nutritious, easily assimilable diet was prescribed, together with moderate exercise, gentle massage and sufficiency of rest. Beside, one grain of desiccated extract of thymus-gland was directed to be taken daily and it was contemplated increasing this dose gradually as the susceptibility of the patient was determined.

The case that I have thus briefly reported is interesting principally from a clinical point of view, as it is a typical instance of the pseudo-hypertrophic variety of the progressive muscular dystrophies. I have used this generic designation of Erb<sup>2</sup> by preference, because it describes sufficiently the condition to which it is applied without committing one to a final opinion as to its pathology. In addition to the variety of which this case is an excellent illustration—the *pseudo-hypertrophic*—there have been described the *facio-scapulo-humeral* of Landouzy-Dejerine, the *infantile* of Duchenne, the *hereditary* of Leyden, the *juvenile* or *scapulo-humeral* of Erb, in accordance with the varying evolution and distribution of the disease. The designation *idiopathic muscular atrophy* also has been employed as descriptive of cases unattended with false hypertrophy. The lines of demarcation are, however, not always clear and well defined, and irregular combinations of two or more types are not rarely encountered. The essential lesion, so far as has been determined, consists in part in proliferative and in part in degenerative changes in the affected muscles, with increased deposit of fibrous and fatty tissues; although Erb is not prepared to commit himself to the view that these are the only changes, maintaining that the nervous system may be the seat of alterations that elude our present means of investigation. For this reason he prefers the designation dystrophy to myopathy.

The muscular dystrophies, while not actually rare, are likewise not common. Of 20 cases that I collected from the records

of the Orthopedic Hospital and Infirmary for Nervous Diseases<sup>3</sup> 18 were observed between the years 1886 and 1896, inclusive, among a total of 8,666 cases of all kinds seen in both dispensary and hospital.

Sometimes congenital, the disease is most common in early life, the first symptoms being noted, according to Gowers,<sup>4</sup> in a very considerable number of cases when the child attempts to walk, which it usually does later than healthy children. In the majority the symptoms appear before the tenth year. Boys are affected in greater number than girls. Of the cases in my collection 16 were in males and 4 in females. Among 220 cases collected by Gowers<sup>5</sup> 190 occurred in males and 30 in females; among 84 collected by Poole<sup>6</sup> 73 were in males and 11 in females; and among 125 collected by Seydel<sup>7</sup> 103 were in males and 22 in females. These figures collectively make a proportion of 5.7 to 1.

Sometimes the disease is acquired by heredity, being transmitted usually through a healthy mother. In numerous instances, several members of one family have been affected. In one family, 8 brothers suffered from the disease.<sup>8</sup> Of Gowers' 220 cases, 102 were isolated, and 118 distributed among 39 families.

In 11 of the 20 cases that I have analyzed, infectious disease, as in the present case, had preceded the onset of the symptoms of the muscular dystrophy; but such disease is so common at this period of life that not too much etiologic significance is to be attached to this relation. In some cases, further, there had been some complication at birth, requiring at times the use of instruments to effect delivery. In other cases, there was a history of traumatism, as from falls upon the back; and in still others a parent was tuberculous, or alcoholic, or paralyzed, or insane.

The disease appears to be rare in negroes. In none of the recorded cases that have come under my notice is it stated that the patient was a black, and in response to inquiries upon this point addressed to a considerable

<sup>3</sup> *Journal of Nervous and Mental Disease*, Oct., 1897, p. 641.

<sup>4</sup> *Manual of Diseases of the Nervous System*, 1892, 2d Ed., Vol. 1, p. 508.

<sup>5</sup> Clinical Lecture: Pseudo-hypertrophic Paralysis, London, 1879.

<sup>6</sup> *New York Medical Journal*, 1875, xxi, p. 569.

<sup>7</sup> Cited by Eichhorst: *Handbuch der speciellen Pathologie und Therapie*, B. III, 4. Aufl., 1891.

<sup>8</sup> Meryon: *Med.-Chir. Trans.*, 1852; cited by Gowers, *loc. cit.*

<sup>2</sup> *Neurologisches Centralblatt*, Oct. 1, 1883; *Deutsches Archiv für klinische Medizin*, xxiv, 1884, p. 467; *Dystrophia muscularis progressiva*, Leipzig, 1891.

number of neurologists and to practitioners in the Southern States, but one is able to say that he has seen a case in a negro, and of this I have been unable to secure the notes. It is probable, therefore, that, like chorea, tabes dorsalis and, I believe, exophthalmic goiter,<sup>9</sup> the muscular dystrophies are exceedingly rare, if they occur at all, in individuals of unmixed African parentage.

Nothing further of a definite nature is known in an etiologic connection, and it is not unlikely that the disease is a developmental one, that it is dependent upon some inherent defect of the embryo.

The symptoms of the disorder are essentially weakness of progressive character, with muscular wasting, although in many cases a morbid deposit of fibrous and fatty tissue gives rise to an appearance of pseudohypertrophy. The muscular and tendinous reflexes become enfeebled and finally lost, while the cutaneous reflexes are preserved. The muscles respond less promptly and less actively to both faradic and voltaic stimulation. Sensibility remains unaffected, and the sphincters continent. The mental faculties are altogether uninvolved. The disease is of protracted duration, and, though progressive in course, it is not directly fatal, death usually resulting from some complication or intercurrent affection, often of a pulmonary nature from enfeeblement of the respiratory muscles.

The muscular dystrophies are to be distinguished especially from peripheral neuritis, acute anterior poliomyelitis (infantile palsy), chronic anterior poliomyelitis (progressive muscular atrophy), amyotrophic lateral sclerosis. From all of these it differs essentially in the absence of qualitative changes in the reaction of the muscles to electric stimulation. From neuritis it differs further in the absence of alterations in sensibility. Acute anterior poliomyelitis, in addition to being rapid in onset, has a tendency to be retrogressive in course, and is amenable in some degree to treatment, while the dystrophies are gradually progressive, and resistant to all forms of treatment hitherto employed. They usually set in earlier than progressive muscular atrophy dependent upon degenerative changes in the ante-

rior horns of the spinal cord, and are unattended with the fibrillary twitchings of this disorder, and also with the bulbar symptoms that develop when extension of the degenerative process to the medulla takes place; further, the small muscles of the hands are uninvolved. From amyotrophic lateral sclerosis the dystrophies differ, beside, in the absence of heightened reflexes.

The prognosis of the muscular dystrophies is, on the whole, rather unfavorable. They are, of themselves, not directly fatal, but, by reason of the progressive muscular degeneration and the resulting weakness, intercurrent disorders and complications, particularly of a pulmonary character, are prone to occur and to terminate disastrously.

Treatment also is not promising. Probably developmental in origin, the disease is progressive in tendency, and is little amenable to therapeutic measures. Much mischief will already have been effected even before the disease is recognized, and it is doubtful if much can be done to check its progress. There can be no hope of restoring the lost muscular tissue. No remedial agent has been shown to have any curative effect. Macalister<sup>10</sup> recommended the employment of thymus extract, which he used in one case; and Lépine,<sup>11</sup> that of thyroid extract, which he used in one case with encouraging results; but data are wanting to show that either of these is capable of actual benefit. The treatment must, therefore, be symptomatic. The general health is to be maintained at the highest possible level, and intercurrent disorders and complications of all sorts are to be sedulously avoided. Gentle exercise within the limits of fatigue is probably the most useful measure at our command, supplying the natural stimulus for muscular growth and development. Electricity and massage occupy a position of secondary importance, but they may be required to prevent or correct shortening of tendons, and occasionally tenotomy may be necessary. The diet should be simple, digestible, nutritious and sufficient. Cod-liver oil, phosphorus, arsenic and strychnin may be employed with discretion.

<sup>10</sup> *British Medical Journal*, No. 1684, p. 729.

<sup>11</sup> *Lyon Medical*, May 10, 1896, p. 35.

<sup>9</sup> *International Medical Magazine*, April, 1898.

## SO-CALLED RETAINED NERVE-SHEATHS IN THE RETINA.

BY GERTRUDE A. WALKER, A.B., M.D.

Read April 13, 1898.

RESEARCHES in embryology have demonstrated beyond question that the optic globe is comparatively well advanced in its development before the nerve, which ultimately connects the eye and the brain, has begun to be differentiated. The fibers of the optic nerve originate in the retina, the axis cylinders within the eye converging toward their points of exit in the lamina cribrosa, and becoming massed together to form the thread of communication between the sense organ and the brain. Consistency, therefore, would require us to speak of the optic nerve as leaving, instead of entering, the eye. In considering the perfected organism, this distinction is usually disregarded, for the reason that after connection between the eye and brain has been established, it is practically unimportant whether we speak of the optic nerve as proceeding to or from either organ. But for the sake of accuracy not only in teaching ophthalmology, but also in applying names to such conditions as the one which forms the subject of this paper, it is worth while to bear in mind the order of development.

After their emergence, the fibers of the adult eye are found to have taken on a medullary investment, but embryologically they do not *begin* to take on this investment at their point of emergence, as the student would naturally conclude from the following misleading statement of Dr. Alexander Hill:<sup>1</sup>

"They (the fibers of the optic nerve) acquire their myelin-sheaths immediately after traversing the sclerotic."

Bernheimer<sup>2</sup> has proved by his investigations that medullation of the optic nerve-fibers proceeds from the brain toward the eye, and he concludes that medullation normally ceases at the lamina cribrosa. Medullation of

the axis-cylinders within the eye produces a characteristic and striking ophthalmoscopic picture,—a dense, white area, of variable shape and extent, in intimate association with the nerve-head, partially or wholly obscuring the retinal vessels, and blending gradually at its edge with the normal, transparent retina. If, now, the nerve-fibers could be regarded, strictly speaking, as entering the eye, the term, "retained nerve-sheaths," would be admissible, implying that the fibers had retained a substance which they should have lost; but since we should regard the fibers as taking their course out of the eye, rather than into it, the name is contradictory.

Certain authors, as Gowers and Frost, probably on account of their recognition of the inaccuracy of the term "retained nerve-sheaths," speak of the condition as "opaque nerve-fibers;" but this name is not above criticism, inasmuch as the word "opaque," whenever applied to the eye, signifies, except in this one instance, a pathological condition. A student of ophthalmology might easily be led by the term "opaque nerve-fibers" to consider the condition a result of disease.

I therefore venture to urge the adoption of the term "medullated optic-nerve fibers in the fundus," in place of "retained nerve-sheaths" and "opaque nerve-fibers," because the name seems to me to remove erroneous impressions regarding embryologic details, and to divest the condition of suggestion as to pathology.

When the context of an article, or the theme of a lecture, clearly implies that only intraocular conditions are under discussion, the last three words of this somewhat long name might be omitted without loss in accuracy; but no part of the term is superfluous when used without regard to qualifying circumstances or expressions.

<sup>1</sup> *American System of Ophthalmology*, Vol. I, p. 387.

<sup>2</sup> *Knapp's Archives of Ophthalmology*, April, 1891.



## DISCUSSION.

DR. EDWARD JACKSON said:—Even if the nerve-fibers are considered as running from the brain the sheaths are not usually “retained.” When so-called retained nerve-sheaths are present in the retina, the nerve-fibers have entered the eye without their medullary sheaths and then resumed them. Even apart from the view Dr. Walker maintains “resumed” would be much more

accurate than “retained.” The latter term has probably become current because properly used with reference to other anomalies that exist in the eye, as persistent pupillary membrane, or retained hyaloid artery. These are really the continuance of fetal structures, and probably through a loose way of thinking opaque nerve-fibers have been classed with them.

## CARE OF PATIENTS AFTER THE OPERATION FOR APPENDICITIS.

BY JAMES M. BARTON, M.D.

Read April 18, 1898.

I BRING this subject before you, as I find there is considerable difference in the method of caring for patients after the operation for appendicitis, among surgeons equally successful.

For convenience I will separate the cases into four groups. (1) Where merely the abscess is opened, either with or without removal of the appendix, the general cavity of the peritoneum not being invaded.

(2) Where the operation is performed between attacks and no pus is present.

(3) Where the general cavity of the peritoneum is opened and the abscess emptied. Most cases of acute appendicitis are in this class. The appendix is usually removed, but if it be removed or not it does not affect the after-treatment.

(4) Where general septic peritonitis exists at the time of operation.

In all operations for appendicitis there is but little danger from shock and none from hemorrhage after the operation is finished. If there be any shock it will readily yield to heat and strychnin. Most if not all the deaths following appendicitis, operated upon or not, are caused by general septic peritonitis. Our efforts must, therefore, be particularly directed to prevent its occurrence, for if it does occur treatment will avail but little.

I. Where merely the abscess is opened. In these cases there is usually some ounces of pus, the patient has been ill for days and perhaps weeks. The abscess is now near the surface and the anterior abdominal wall forms the anterior wall of the abscess. On cutting through the anterior abdominal wall we find the pus at once. This pus is prevented from getting into the general peritoneal cavity by the adhesions between the intestines, which adhesions are often ex-

ceedingly weak. If the abscess be opened without rupturing the adhesions which protect the general peritoneal cavity the patient will surely recover. If they are ruptured and the intestines outside the pus cavity become infected, the danger is very great. If they are ruptured during the operation, by accident or design, the operator will convert the case into the third class, but if he decides to only open the abscess, but little further interference is permissible. With the greatest gentleness, the abscess cavity is explored by the finger, the foreign body, if any exists, is removed as well as the appendix, if it can be done without rupturing the protecting adhesions. It is not advisable to wash out this cavity with any disinfectant, or other fluid, either at the operation or subsequently, as we endanger the barrier, which protects the general peritoneal cavity, and no drug could possibly disinfect the germ-filled lymph with which this cavity is lined. Nothing less than turning this abscess wall inside out and scrubbing it, could possibly suffice. Drainage by rubber tubes, of large caliber, will be entirely satisfactory, and through them the broken-down lymph will be discharged without difficulty or danger. If there is no reason to suspect that rupture of the barrier has occurred and no symptoms of peritonitis develop within twenty-four hours, the case may be treated as an ordinary external abscess, bearing only in mind the possible weakness of the barrier protecting the general peritoneal cavity.

The treatment consists in perfect rest in bed, no food at all for twenty-four hours and but a limited quantity of water, say 12 ounces. If no symptoms of peritonitis develop by this time the patient can take liquid diet and larger quantities of water. By

the third day he can have ordinary diet in moderate amounts, such as soft boiled or poached eggs, stewed chicken or mutton, milk or dry toast, etc. The soiled dressings should be removed once or twice daily, but syringing out of the cavity is not advisable. The stitches may be removed from the seventh to the ninth day, or sooner, if greatly infected. The drainage tube may be shortened by that time and removed from the fifteenth to the twentieth day. As gauze will not drain pus, there is no need of it at all in this class of cases. There is no hurry about the bowels being opened, and under no circumstances is it advisable to purge for several days after an operation. If the bowels do not open by the third or fourth day without aid, a stimulating injection is all that is necessary. To prevent hernia the wound should be strongly supported, from the first, by rubber plaster fitted with tapes.

How readily the barrier protecting the peritoneal cavity may be ruptured is illustrated in the case of a physician in the country, on whom I operated. On cutting through the abdominal wall, a large quantity of pus came with a gush. The force with which it came and the absence of symptoms of general peritonitis led me to believe that it was surrounded by strong adhesions; nothing more was done except the introduction of a rubber-drain. But while the patient, who weighed over 250 pounds, was being removed from the operating table to the bed which was somewhat lower, he escaped from the hands of the nurses and fell on the bed face downward. Within five hours he had well-marked general peritonitis, I re-opened at once, flushed, and drained, but without success. It is hardly necessary to state that all adhesions were separated, and the appendix removed at that time.

II. When the operation is performed in a period of quiescence. Here everything is supposed to be aseptic, and the abdomen is closed tightly, without drainage. The only danger is the infection of the peritoneum from outside sources at the time of operation. No food whatever is given during the first day, and but a limited quantity of water. I am in the habit of giving but 12 ounces the first day, and from 18 to 40 the second, depending upon the condition of the patient. The water is at first given very hot, a tablespoonful every hour, to prevent ether-vomiting. In a few hours, if the vomiting has

ceased, the temperature of the water is unimportant, though no ice is permitted, as it favors the production of gas in the intestines.

The quantity of water is limited by American surgeons, so the patient may be thirsty enough to cause absorption of any fluid thrown out in the abdominal cavity, as fluid there favors the growth and distribution of septic germs. The English and French surgeons limit the quantity of fluid solely to prevent ether-vomiting. While they limit it by the mouth, they allay the thirst by large injections of water (Pozzi, Greg, Smith, Treves.) If no abdominal distention occurs, and wind passes by the bowel in from twenty to thirty hours, general septic peritonitis will probably not occur, and larger quantities of fluid may be permitted. At the end of two days, full quantities may be given. This will be about 40 ounces in winter and 75 in summer, and includes the water in tea, beef-tea, chicken-broth, etc. By the fourth day, if the patient is doing well, solid food in small quantities may be given, mainly food digested in the stomach, such as shreds of chicken in chicken-broth, mutton, lamb, eggs poached or soft, boiled rice and dry or milk toast. Milk can also be given if the gas is passing freely, and it is known to agree with the patient, when well. If, during the first day or two, the patient has severe pain, a hypodermic of morphin may be given, but is not to be systematically used. The bowels may be moved on the fourth or fifth day by a stimulating injection, but no active purgative should be given as long as it can be avoided. The bowels often act without aid.

III. In this class we find most of the cases operated upon. Here the general cavity of the peritoneum is opened, the site of the abscess surrounded by gauze and the abscess emptied. The appendix is usually removed, though the after-treatment is the same if it is removed or not. Here the case is left with a large quantity of gauze in the abdomen surrounding the field of operation. A corner of each piece of gauze is left protruding from the wound and one or two rubber drains pass through the center of the gauze to the most infected part.

The wound has been closed by the interrupted suture and the stitch next the drains has been tied in a bow knot so that it can be temporarily loosened to remove the gauze if necessary. Perfect rest on the back is insisted on, even more rigidly than in the

other classes, as the adhesions protecting the abdominal cavity have yet to form. Each day the gauze on the surface of the wound is removed, the surface cleansed and gauze reapplied. On the third day, if there are two rubber drains, the one that is doing the least work is removed and a corner of the protruding gauze is gently drawn upon and whatever portion comes out readily is removed, and each day another attempt is made. By the fifth day it usually all comes away, though it occasionally is delayed until the seventh or eighth day. There is no occasion to give the patient much pain in removing it, for if it does not come readily one day it will the next. I have never seen it do harm by remaining. In a patient at a distance, on whom I operated, a piece about the size of a handkerchief was retained 22 days without doing any injury or giving rise to any symptoms.

The surface of the abdomen around the wound is cleansed daily with a gauze sponge damp with some antiseptic, and a fresh gauze dressing applied, but no injection of any kind is employed in the interior of the wound, and when the gauze is removed it is not repacked.

The objection to injecting, repacking or other manipulation in the interior of the wound is that in this class, as in the first, the general peritoneal cavity is protected by adhesions between the intestines. These adhesions formed outside the first gauze packing, but as they did not begin to form until after the operation they have but little strength for several days. In one patient, belonging to this class, from whom I removed the appendix, some years ago, a glass drain tore the protecting adhesions five days after the operation, with a fatal result. I verified the lesion by a post mortem made within an hour after death before removal from the bed on which he died. At the examination the protecting adhesions, most of which still remained, were like cobwebs in strength. Since then I have not used glass drains in these cases, rarely inject these wounds and use no violence to the protecting adhesions.

To avoid hernia the wound should be strongly supported by rubber plaster on each side joined by tapes tied across the wound. The gaping part around the drain should also be strongly drawn together in the same manner after the wound has cast

off its sloughs and is granulating well, which it usually does by the eighth or tenth day. From this time the drain may be shortened daily and entirely removed on from the fifteenth to the twentieth day.

It is an error to remove it too soon. I have twice had to re-open the wound under ether and reintroduce a drain I had removed too soon.

IV. When general peritonitis has occurred before the operation. The abdomen has been opened, adhesions broken down, the appendix removed, the abdominal cavity freely flushed, counter openings made and drains of all kinds liberally introduced.

Here there is no objection to frequent flushings through the drains, and if we are to have much success in this class of cases it will probably be due to even more thorough irrigations than are usually practised.

The gauze from the surface into which the drains empty is removed several times daily and replaced. Small and repeated doses of calomel are given, as they are better retained than more bulky purgatives, and some purgative is necessary to keep up the peristaltic action of the bowels and prevent over-distention and the resulting obstruction from sharp flexion, snubbing or kinking.

The rectal tube should be introduced about every three hours and retained at least half an hour. If the patient desires it, as they often do, it may be retained much longer. In introducing it should be slowly rotated until the odor of escaping gas is detected, when it should be permitted to remain at that point. If the orifice at the point of the tube is obstructed it can be cleared by the injection of a small quantity of fluid, to which a few drops of turpentine can be advantageously added. If fecal vomiting is constant the stomach should be washed out, as it prevents the depression following fecal absorption and permits the stomach to be used for liquid food and stimulants. Nourishing enema can be administered. Under any form of treatment the mortality is very high. As a variety of Class 4, which we have been considering, we may include peritonitis appearing after any of the operations in any class.

Instead of doing well, as we have hitherto considered, the patient may do badly. Then the abdomen becomes distended, on auscultation no wind can be heard passing through the intestines, none passes by the

anus; vomiting or rather the regurgitation of small mouthfuls of water occurs, and this after a time becomes blood-stained, then looks like coffee-grounds and ultimately becomes fecal. If any radical measure is to be adopted with any hope of success, it must be done early, soon after the rupture and escape of the purulent matter into the general peritoneal cavity and before the intestines have become seriously infected. Under these circumstances there is some hope by very free flushing and drainage, though some successes have been recently reported when the operation has been performed rather late. Personally I have reopened the abdomen quite frequently for infection after various operations, but so far without success.

If after any operation for appendicitis fecal matters come through the wound, it needs no special form of treatment, as it nearly always disappears spontaneously. I have known complete recovery take place

where all the fecal matters came through the wound for several days following the operation. Even if nature fails to effect a cure no operative interference is advisable for several weeks.

To prevent hernia following the operation not only must the wound be as completely closed as possible with sutures, but it must be strongly supported during the after-treatment with rubber plaster and tapes. After the wound has healed the parts must be supported for several months. I have used the various bandages that have been invented, but have most faith in long strips of rubber plaster. Three strips, each about two feet long and two and a half inches wide, will give good support. These can be replaced when loose and worn several months. If the abdomen is large a closely fitting muslin abdominal support can be worn in addition with advantage. When a hernia has actually occurred it can best be supported with a spring truss with a flat pad.

## DISCUSSION.

DR. O. H. ALLIS, referring to the patient, who was dropped in being put to bed by the nurses, said that he sometimes found patients lying in bed in such pain that they could hardly be moved, and while it was customary among surgeons to take such patients out of bed and place them on a table and after operating put them back in bed, it was his invariable custom, when he had any suspicion of abscess, to operate on the patient just where he found him, so that the sufferer might not be disturbed. On an occasion when this subject was under discussion, Dr. McBurney said that the protective structure thrown out by nature is so thoroughly infected that it cannot be made clean, and therefore washing or cleaning of any kind was futile, and that whenever anything happened during an operation to cause a portion of gut to be pushed out of the opening the result was invariably fatal. Dr. Barton's experience was the same. In a case upon which Dr. Allis operated he found, at his visit on the following day, the gut had passed through the protective band and engaged in the unclosed aperture of the wound. Taking advantage of what Dr. McBurney said, Dr. Allis let it

alone, it gradually withdrew into the wound and the patient recovered. Months afterwards, when the wound had healed entirely, he reopened it and treated the hernia. A lad of 16 or 17 years of age, operated on at the Presbyterian Hospital, was transferred to Dr. Allis by his predecessor. In a paroxysm of pain this boy suffered protrusion of 6 or 8 inches of gut, which the interne immediately restored. In 6 or 8 hours general peritonitis developed. Dr. Allis opened the wound, withdrew the gut that had protruded, and washed it out as carefully as he could with normal salt solution, but without effect. The boy died in less than 24 hours from the time of the protrusion. Hence the importance and excellence of Dr. Barton's recommendation that the abdominal wall should be thoroughly protected by strips of adhesive plaster, and by sutures so introduced as not to interfere with drainage while aiding in approximation. Dr. Allis has never seen general peritonitis follow appendicitis of the type of Dr. Barton's third or fourth class. He had seen cases that might be called general, but they had here and there unaffected areas, and he thinks that this is

frequently the case. Perhaps one of the reasons for failure to cure in these cases is, that while infected parts are being washed out uninfected parts are being inoculated. One of the most serious problems to contend with, is how to deal with cases of diffuse peritonitis following operation for appendicitis.

DR. L. J. HAMMOND expressed his doubt whether surgeons, dealing with the cases of Dr. Barton's third class, could be sure of having thoroughly cleansed the septic material, and of not having infected the abdominal cavity. Therefore, it has been his practice, where there was any possibility of the cavity being infected through escape of the sac-contents, to wash the entire cavity thoroughly. He felt that, since the abdominal cavity was considered so capable in getting rid of beef-steaks, etc., that it would probably be able to manage a small amount of infected material better, if distributed over the entire peritoneal cavity than if confined by limited washing to a small area. Abscesses of the first class, being subcutaneous and usually long-standing, lead one to assume that they have very substantial walls around them, and are not likely to be ruptured by syringing, since they have stood so much pressure from within. An abscess cavity will granulate more promptly if gently packed, while the pent-up pus should be most effectually removed by gently syringing.

DR. GEORGE ERETY SHOEMAKER commended Dr. Barton's accurate division of this subject, and while admitting that there is a very wide difference of procedure in the after-treatment of appendicitis, said that it had always seemed to him that in the large number of these cases the problems were very nearly the same as those after any abdominal section. Of course if a large abscess is opened which has become virtually exterior to the body, and is very thoroughly walled off, it makes very little difference how that case is treated, it will get well with free drainage. But, in a great many instances there are virtually exposed, in operating, many new areas of peritoneum, and the nerve conditions in the peritoneum and bowels are disturbed, so it is important that the same general rules of procedure be carried out. Among these rules should be the administration, for at least one week after operation, of food that is not likely to produce fermentation in the intestines. On

that account it has seemed to him wiser not to give solid food in the first week.

Many good operators, however, begin with solid food on the third or fourth day. Dr. Shoemaker considers eggs and milk particularly undesirable in the first week. Eggs because they undergo changes which result in gas production, particularly the yolk of eggs. Having tried eggs and found them indigestible in some abdominal cases, he has entirely discontinued their use until the patient was well on his way to recovery. The objection to milk is that it produces gas and also hard fecal matter, and this in passing by a weak point may irritate. The feces do not ordinarily become solid and hard until they have passed from the small intestine and have therefore passed the seat of lesion, but in a certain number of cases intestinal adhesions are very widespread, they involve the large bowel, and the presence of solid fecal matter in any portion of the tract is undesirable and therefore milk should be avoided, unless thoroughly mixed with such a material as strained gruel or something which does not tend to produce a hard stool. The avoidance of purgation is an excellent plan if there is doubt of thorough closure of the site where the bowel was opened. If the site of the appendix can be obliterated and thoroughly stitched with rows of Lembert suture, the adhesions covering the point are firm in a very few hours, the silk stitches themselves are thoroughly buried, and the danger of tearing out is relatively less than the dangers which come from the accumulation of gas in the intestine. Quiescence of the intestine favors adhesions and subsequent kinking or obstruction of the bowel. In other words, if a gentle laxative is given fairly early, or if in some way peristalsis is stimulated, the formation of adhesions and distention of the bowels, which cause many fatal results in all forms of abdominal section, are prevented. When it is necessary to flush appendicitis cases, it is very important that the stream of water be introduced at the furthest point which it is intended to wash, so that the return-flow, which should always have an ample exit, can carry all infecting material outward. If the supporting adhesive straps have tape-ends, as recommended by Dr. Barton, the support is applied at points at least 2 inches apart. But if rubber adhesive strips, 2 inches wide, are applied at first entirely

across the dressing and, when it is necessary to examine the wound, are cut along the line of incision, then the ends may be solidly united with a safety-pin, thus giving stable support all along the wound, and not simply at the point of tape-attachment. This method has been employed with satisfaction by Dr. Shoemaker for at least five years.

DR. O. H. ALLIS, in feeding patients after this operation, has often observed that sloppy foods, milk, etc., are repulsive, but that a good piece of beefsteak, about the size of two fingers, may mean almost the salvation of that patient. It will be chewed, and the substance can be partly rejected and partly swallowed. A nice piece of beefsteak is almost entirely disposed of in the stomach. It is not so much what is given, but how much. Patients often suffer exceedingly from nurses following out the doctor's orders to the letter.

DR. G. E. SHOEMAKER replied that in some of these cases there is such profound depression, as in any profound alteration of the nutrition, that digestion is in entire abeyance. He never used milk after abdominal section.

DR. JAMES M. BARTON closed the discussion, saying he rarely gave milk in these cases, or indeed after any abdominal sections, and then only to patients who expressed themselves as thoroughly able to digest it when well, and who had gotten to that point at which there was no abdominal distention

and the bowels were acting freely. He objects to the early use of milk, as it develops gas which causes distention and pain. Purgatives were mentioned. They may be unobjectionable or even desirable in cases of the second class. Here the appendix is removed during quiescence, there is no infection and the wound is tightly closed. The purgative cannot tear its way through the place where the appendix was, as that is firmly closed by stitches, and it may prevent the formation of undesirable adhesions. But purgatives are objectionable in the first and third classes; in both, the infected area is separated from the non-infected by adhesions between the intestines. To these cases Dr. Barton does not give purgatives, as the peristaltic action might tear those adhesions, producing a fatal peritonitis. Speaking of tapes, he said he had formerly been in the habit of using one large piece of rubber plaster on each side of the wound. These pieces were cut into many tails at their outer edges and laced together across the wound, as has been described by a preceding speaker. Dr. Barton had abandoned the use of large pieces of plaster, as fluids got under them and loosened them in parts, when the entire plaster had to be removed. When the plaster, in small pieces, becomes loose, each with its tape is readily removed and replaced, the pieces that are still fast being permitted to remain.

## INSTRUMENTS FOR DETERMINING THE PERCENTAGE OF HEMOGLOBIN, WITH REMARKS UPON TECHNIC.

BY JUDSON DALAND, M.D.

Read April 27, 1898.

THE three instruments that are ordinarily employed for the clinical determination of the percentage of hemoglobin are the Henocque, the Gower, and the Fleischl hemometers. The Henocque has been used in certain parts of Europe, and but rarely in this country; the Gower is used considerably in England, and the Fleischl has come into almost universal use here. The Henocque is a useful instrument, but the large quantity of blood required in making these estimates and the difficulty experienced in securing a sufficient number of large sized drops, more especially in cases of anemia, is so great that practically this instrument is rarely employed. Ordinarily six or eight drops are required to make an estimate of hemoglobin by Henocque's hemometer. The Gower instrument requires that a carefully measured quantity of blood be mixed with water until it matches the color of a tube of the same size filled with gelatin stained by aniline until it is the color of diluted blood. Satisfactory results are obtained with difficulty, and the fact that these tubes are separate and are under different conditions of light makes it exceedingly difficult to exactly match the color in the gelatin tube. Furthermore, the gelatin in this tube in the course of time not infrequently becomes lighter, and this is an additional error of considerable importance. At the present time most workers prefer the Fleischl instrument, and my object this evening is to call your attention to several points in the technic of this instrument.

In the first place, the blood may be obtained from the finger, the lobe of the ear, or the thumb, the latter being the best, as it presents a considerable surface, and we can usually find a flattened or concave area

where the emerging blood will remain as a drop and not roll down the side of the thumb. I will now call your attention to the lancet: The first lancet that seemed to be of especial service so far as I know was that which accompanied the Gower instrument; but it had one decided disadvantage, namely, the point was too sharp, so that in those cases where the skin was rather thick it was necessary to penetrate deeply in order to secure the requisite amount of blood. The lancet I have been employing for some time is made of metal and the point is spear-shaped.

The use of metal permits of its being easily and thoroughly cleansed and enables one to make certain that it is always antiseptic, thus possessing a considerable advantage over the one formerly used. Furthermore, the method of puncturing has been improved by placing the instrument horizontal with the finger and then bringing it quickly to a right angle instead of puncturing the finger in the ordinary way. In this way the point may be introduced exactly where one desires, which experience has proven should be in the line of the axis of the thumb, and the amount of blood required is secured with a minimum amount of pain and discomfort to the patient. I wish to call attention to one or two other points: In the first place the examination of a specimen of blood that contains a small percentage of hemoglobin is always somewhat difficult and in many instances very unsatisfactory. The use of two or three pipetsful of blood with the regular quantity of water in the cylinder overcomes this difficulty and brings the color of the blood up to or even higher than the point necessary for accurate reading. To secure a proper dilution, under ordinary



circumstances only about 6 to 8 c. mm. of blood are needed, but even when this is attained a number of difficulties may arise, of which the turbidity which is present in certain conditions of blood is one of the most difficult to overcome. In some cases the cause of this turbidity may be easily explained, while in other cases it is entirely unknown to us. It is quite possible that not infrequently this turbidity may be due to changes in the plasma, although some authors believe it to be due to the breaking up of the red corpuscles which under these conditions differ in tint from the colored glass wedge, and it is therefore only possible to secure approximately good results.

I know of no method to overcome this difficulty. One has been suggested but which I have never employed, and that is the adding of a certain amount of alkali.

Under ordinary circumstances one of the difficulties in the use of this instrument is to prevent the rays of light from the candle coming in contact with the eye of the observer, which disturbs very materially the accuracy of the reading. For quite a number of years I placed a large piece of black pasteboard above and behind the candle so as to cut off all rays of light, which method I found was a great improvement and facilitated accurate reading. This is a matter of importance, and it aids much in the judgment of colors. The long cylinder recommended by Fleischl possesses some advantages, and I have used it occasionally, but I believe it is rarely employed to-day. It is about ten inches long, made of metal, and one end is placed over the cylinder and the eye applied to the other as in looking through a microscope. In the use of the hemometer there is much carelessness regarding the position of the eye, which must be placed directly over the cylinder in such a manner that the color field to be compared occupy the tem-

poral and nasal fields of the retina. Then, too, in regard to the use of a reflector; just as much care must be taken in regard to illumination as would be observed in the use of the microscope, and this is particularly true of blood containing small quantities of hemoglobin. The point upon which I desire to lay especial stress is in reference to the method of reading the results obtained with this instrument, and to call attention to the fact that the distance from one extremity to the other of the cylinder is so great that it represents 16 per cent. on the scale. In other words, in making comparison the retina takes cognizance of a distance equal to about 16 per cent. To determine a midpoint or 8 requires considerable practice, and upon reflection it occurred to me that a little device could be constructed which would overcome in a large measure errors from this source. It seemed to me that if we could reduce the size of the opening so that the eye would only focus on a slit exactly in the center of the cylinder having a width of one-eighth of one inch, we would be in a position to compare more exactly the relative colors of the solution and determine the percentage present. The appliance is extremely simple, a metal cap with an one-eighth of an inch slit which fits on top of the cylinder. When this device is employed more accurate readings are obtained.

A point barely touched upon in the original description of the technic, that of the position of the eye-ball in reading the percentage, should be referred to. It is stated that the temporal and the nasal halves of the retina are more sensitive to color than are the superior and inferior halves, and therefore I believe it would be wise to place the eye so that the two colors will be placed on the temporal half and the nasal half of the retina, in order to secure the best results. This point is often overlooked.

## THE BLOOD-CHANGES INDUCED BY ALTITUDE, AND THEIR PRACTICAL VALUE.

BY S. EDWIN SOLLY, M.D.

Delivered April 27, 1898.

THE lecturer first called attention to the fact that, in the selection of climate for the cure of disease, physicians failed to recognize, because they had failed to study, the very great differences in the physiologic and therapeutic effects of change of air at high altitudes as contrasted with those at or near sea level. As this lack of knowledge is so widespread, it was deemed well to outline the subject before passing to the more special influence of, and the more recent investigations upon, the blood-changes induced by altitude. While any elevation of the land above sea level, however slight, has some modifying influence upon the climate, yet the peculiar effects of altitude are not exhibited in any striking degree until an elevation above 4,500 feet is reached. As the lecturer's observations have been carried on for the most part at Colorado Springs, which stands 6,000 feet above sea level, he took that as the elevation to which most of his remarks were to apply.

Mountain sickness is that physiologic disturbance which occurs more or less in all human beings and animals who ascend to a high altitude. For a long time these disturbances, which somewhat resemble seasickness, were ascribed directly to the diminished amount of oxygen present in the air. It has now been proved, beyond question, that they are due not directly to this cause but to the diminished oxygen-tension. At a high altitude there is a diminished barometric pressure, in consequence of which the molecules of air are more widely separated than at sea level. Therefore the actual amount of oxygen in each cubic inch of air is lessened. But at any height to which man has ever ascended, the absolute amount of oxygen has always been sufficient to carry on

life, although oxygen can only be absorbed through the blood under a given tension, and, at these heights, the tension is reduced beyond what the blood, as it is normally constituted at sea level, is able to absorb in sufficient quantity to carry on life comfortably. That life is maintained under these conditions is because Nature steps in and, by producing certain blood-changes of which we shall proceed to speak more in detail, compensates for the disabilities produced by the diminished oxygen-tension. It is recognized that the red blood cell, by the intervention of the hemoglobin which it contains, is the vehicle whereby oxygen is absorbed. In normal man the number and size of the red corpuscles and the percentage of hemoglobin always bear a definite proportion to the atmospheric oxygen-tension, so that when the oxygen-tension diminishes the number of red corpuscles and the percentage of hemoglobin proportionately increase. This has been proved by numerous eminent observers in the laboratory and at high altitudes, in the Alps, the Andes and the Rocky Mountains. The chart shown, exhibits a blood curve, clearly representing the increase of red cells, observed to exist in an ascent from sea level to an elevation of 15,000 feet. It will be observed that the ratio of red blood-cells always increases in direct proportion to the elevation at which the observations were taken. For instance, the normal blood-count in an individual at sea level being between 4,000,000 and 5,000,000, it would be raised to 8,000,000 upon his ascent to Merococha, Peru, an elevation of 15,000 feet. At Colorado Springs, 6,000 feet, the increase would be about 1,000,000, making it 6,000,000. I have not with me here a chart, which ex-

hibits, in the same graphic manner, the proportionate increase in the percentage of hemoglobin. The increase in the blood of a healthy Philadelphian, after a few weeks' residence in Colorado Springs, would be 16 per cent. In an unhealthy person it might be greater, as will be explained. That these effects are primarily due to the reduced barometric pressure, which causes the diminished oxygen-tension, was conclusively proved by the experiments of Paul Regnard, who, at the Sorbonne in Paris, tested the blood of a rabbit and then kept the rabbit confined for a month under a continuous diminished air-pressure, which was equivalent to an elevation of 6,000 feet. At the end of the month the rabbit came out fat and healthy and the blood-analysis showed an increase in red cells and hemoglobin exactly the same as that produced in a rabbit sent from sea level up to an elevation of 6,000 feet. Therefore, while open-air life, changes of temperature, increased sunshine, dryness, etc., are exhibited in elevated regions, and tend to improve the general nutrition, and so are of value, and are an aid in producing blood-changes, yet they are of very minor importance in the solving of the problem we are considering. As in the case of blood-regeneration following hemorrhage, while the number of red cells begins immediately to increase, the proportion of small cells is much larger than in normal blood and shows that at first the new cells are small. By the end of a month's residence at an altitude, however, the size of the corpuscles again becomes normal, although their number is increased. The increase of hemoglobin begins more slowly than the corpuscular development and is not markedly noticeable until after the sixth day. Then the rate of hemoglobin-increase becomes more rapid, while that of growth in the number of corpuscles begins to lessen. These changes exist not merely in the peripheral vessels, but throughout the entire circulation, as has been proved by testing the blood of animals not only in their superficial but also in their deep vessels, and the same results have been found in each. The possibility of the cause of the greater blood count not being really blood regeneration, but merely a relative increase, due to the dryness of the air, causing increased evaporation, and therefore less fluid in the blood, has been inquired into and

proved to be incorrect, and indeed this idea is negated by the fact of the increase of hemoglobin and of iron. As I am aware that we gentlemen who reside at high altitudes, having an axe to grind, are viewed with some suspicion when we make astonishing assertions about the peculiarity of the climate of high altitude, I am glad to assure you that the statements I have made have been proved by trained observers, who live and whose interests are centered in localities near sea level. At the same time we residents of the upper ether have contributed our share towards the confirming and extending of these observations, and I will make some reference to my own observations at Colorado Springs.

In the estimate of the red cells, I have been much gratified with the efficiency and value of the improved hematokrit of my friend, Dr. Judson Daland. It is a convenient and, I believe, an accurate method of estimating the number of red cells. I have used it alongside of the Zeiss-Thoma counter, and found the results practically the same, which is interesting, especially as the Zeiss-Thoma instrument gives the increase in the number of cells, while the Daland instrument records the increase in bulk. The fact that there is a larger corpuscular bulk shows that the increase is not merely in the number of cells, but in the total corpuscular area, and, therefore, is an absolute enlargement of the surface from which oxygen can be absorbed. I have spoken so far merely of the increase in red cells and hemoglobin caused by the *ascent* to a high altitude. After the individual or animal becomes resident these changes, which commence within the first 24 hours, continue at a lessening rate for about a month, and, though still more slowly, even extend over a period of six months, after which the increased gain is permanent and stationary, so long as the individual resides at the same level, but on *descending*, the process observed on ascent is reversed, and the blood-count and hemoglobin diminish in proportion to the descent. This is graphically shown on the second chart by M. Mercier. He, with his family, had ascended from Zurich to Arosa, an increase in elevation of about 1,300 to 6,000 feet. His blood-count increased in the normal proportion. After residing at Arosa for six months, he, in a single day, descended 1,300 feet, and his count at

once dropped in proportion. The day following his descent, he again ascended to Arosa, and his blood-count increased approximately once more to what it had been when he left. This proves very conclusively that these blood-changes are compensatory. To turn now to mountain sickness, it is exhibited in a greater or less degree, according to the strength of the physique, or the nervous impressionability of the individual ascending to high ground. These symptoms have been exactly reproduced in the laboratory, where an individual has been kept under diminished barometric pressure. The experiments of Paul Bert are too well known to detail at length, but I will refer to the notable one in which he sat under diminished pressure equivalent to 29,000 feet elevation, and felt perfectly comfortable as long as he inhaled oxygen and did not exert himself. Strangely enough, only a few days later the memorable accident occurred to Messrs. Croce-Spinelli and Sivel, who subjected themselves to an identical diminution in pressure by ascending in a balloon to a like elevation of 29,000 feet. They became paralyzed and could not hold the tube in their hands, which would have conveyed oxygen to their lips and revived them. They became unconscious and died for the lack of the oxygen which had kept Paul Bert in perfect comfort under a like diminished pressure. The chief symptoms of mountain sickness are shortness of breath, rapid heart-beat, giddiness, nausea, and mental exhilaration. The increased number of respirations and the increased heart-beat are undoubtedly the means whereby Nature attempts to temporarily compensate for the inconveniences and dangers brought about by the lack of power on the part of the blood to absorb sufficient oxygen. When, however, the blood gains this power, the rate of respiration and heart-beat, returns to normal. External measurements of the chest, and of its internal capacity, have proved that while, after acclimatization is accomplished, air is not taken in more frequently than at sea level, the quantity of air taken in at each inspiration is increased. This is shown also by the normally emphysematous character of the breathing, particularly observable in native-born children.

With respect to the action of the heart, while the rate of contraction becomes normal, the amount of blood propelled at each

stroke becomes undoubtedly greater, because there ensues a normal hypertrophy of the organ. This is evidenced by the increased power of endurance exhibited by both men and animals who are thoroughly acclimatized. Horses trained on the uplands can endure longer and run faster than horses of like class at sea-level. The records made by bicyclers upon the Denver race-track, as compared with the records of the same men on the track at sea-level, confirm this. The evidence collected by Hirsch, in his well-known work upon the Geographical Distribution of Disease, is additional evidence. Thus we see that, in addition to the blood-changes, we have increased power both respiratory and circulatory. As the blood-pressure is lowered, aneurysms and heart-lesions, under certain conditions, are mitigated instead of being aggravated by altitude. This reduction of blood-pressure also accounts for the well-known clinical fact that hemoptysis is less apt to occur in a high than in a low country. By reason of this diminished blood-pressure, the peripheral vessels are fuller than usual, as shown in the reddened skin, while the retention of blood in the deep organs is diminished, all of which has been demonstrated in the laboratory, and has been counterchecked by experiments on the effects of increased barometric pressure, which give exactly the opposite results. For this reason internal congestions are frequently relieved. All these processes that have been referred to are augmented by the dryness of the air, causing greater evaporation from the lungs and skin, and therefore calling forth increased activity of secretion. Moreover, the cool air and the hot sun, alternately acting, healthily stimulate the nervous system. For these reasons appetite, metabolism, and functional activity are all beneficially increased. Before leaving the subject of the physiologic effects upon normal human beings I would urge you to read and study the original statements of the facts and observations upon which my assertions are founded. Perhaps the most convenient and the best epitome of the subject is to be found in the recent work by Paul Regnard, Professor of Physiology at the Sorbonne.

Passing now to the therapeutic value of these physiologic changes produced by elevated climates, I will first tell you that these

effects are most markedly shown upon the anemic and the consumptive. Thus a person whose blood-count at sea level is below normal will, under the process of acclimatization in a high altitude, gain more rapidly than the healthy, and will for a time exceed even the count normal to the elevation. The increased red cells and the hemoglobin continue with him while remaining in the altitude, and when he returns to sea level, while they drop down to what is normal for sea level, he does not return to his former condition in which the count was subnormal, so that the gain is more than a compensatory one. The theory is that the need of increased power of blood being greater in these sick persons it is supplied with abnormal energy and in abnormal quantity. While increased nutrition, in whatever way it is brought about, will produce these blood-changes in a greater or less degree—as is shown, for instance, in testing the blood of ordinary and prime sheep—and can undoubtedly be brought about by any climatic change which improves the appetite and nutrition, yet where the power of digestion is impaired so that no remedy or change will give rise to increased assimilation and nutrition, then it is best, and the experiment is often successful, to seek a high altitude, where the blood-changes are forced by the laws of compensation to precede instead of following the increased nutrition. With the improved power of the blood produced by the diminished air-pressure, the power of digestion and the desire for food are unquestionably increased, so that the patient is able to eat in excess of his normal requirements and compensate for the waste brought about by disease. It is therefore right to say that the blood-changes produced by altitude do not stop short at compensation, but advance to a therapeutic value. It is of course to be understood that there are individuals and diseases, intrinsically, or under certain circumstances, which are incapable of taking on this blood regeneration, or to whom the other conditions of life in an elevated climate are inimical. Further there are reasonable grounds for believing that the bactericidal power of the blood is increased. I have at last succeeded in inducing some physiologists to take up this problem, and I trust it will not be long before they furnish me with evidence justifying this belief. Some of the reasons for holding this theory

are that the manifestations of germ diseases occurring in high altitudes are for the most part abnormally slight, and the immunity from phthisis among the residents in high climates, while only partial, is still very considerable, as has been demonstrated by numerous observers.

With respect to this matter of immunity it is interesting to note that it is not merely a question of unhygienic conditions or of overcrowding, because it has been shown that while there has been a slight increase in the mortality from phthisis where cities at high altitudes, such as Denver, have increased in population and decreased in sanitary conditions, it has also been shown that the increase in mortality has been very much *greater*, and, indeed, risen to the relative normal amount, in those parts of the earth's surface, at sea level, upon which immunity has previously been conferred, by reason of the sparseness of the population and the distance from sources of infection. These facts have been demonstrated by the increased consumptive rate under the influence of the cold of Greenland, the humid warmth of the Sandwich Islands, and the dry heat of the African deserts.

With respect to the necessary length of residence at a high altitude for a consumptive, it may be said that, as a rule, sufficient length of time is not allowed, and after all active process has ceased an interval of six months to a year is advisable, before the patient can return permanently to his home climate; but it is often of advantage when a patient is doing well, though the disease may not be fully arrested, to let him go home for a month; but we clinicians have found that it is often important that the month should not be extended even to six weeks, the probable reason being that in the month the increased blood-power is more or less retained, after which the patient begins to feel the depressing influence of his home climate upon his disease.

With respect to what class of consumptives should not remain permanently or may safely return home, it is not my business tonight to discuss; but I may state the fact that contrary to a very common delusion when the disease is arrested at a high altitude, the permanency of the cure after return home is probably even greater than it is when it has been secured at lower elevations. I have patients who were cured in Colorado liv-

ing in the cities of the Atlantic and Pacific seaboard, in England and elsewhere, who have remained well after many years' absence.

As showing how clinical experience marches with the theories put forward from these physiologic studies, I call your attention to Chart No. 3, which indicates the percentage of benefit among the patients in the various groups of climates to which they were sent. How this table was constructed, representing an analysis of about 8,000 cases of phthisis, with the original notes and references, can be found in my Handbook on Climatology. The probable benefit, as you see, rises gradually from the ocean towards the inland, and jumps up suddenly from the desert countries to the altitudes, so that two deductions can be justifiably drawn from it, that phthisis improves with removal from the sea on account of the increased dryness, and it improves still more markedly with removal to elevated regions; and here undoubtedly we see the beneficent influence of the blood-changes we have been studying. With respect, again, to the therapeutic use of altitude, I wish briefly to refer to the matter of exercise. It has been shown by experiments of observers, especially by Paul Bert on animals, by M. Mercier at Arosa; upon human beings, that excessive exercise decreased the blood-count and moderate ex-

ercise increased it; underfeeding combined with excessive exercise having especially marked deleterious effect, so that the beneficial blood-changes were greatly minimized or even obliterated. Again, in high and dry climates weather-changes are necessarily rapid and extreme, and mental exhilaration and nerve-excitation are notably increased, therefore, prudence and accurate knowledge of the dangers run is the first essential of the successful use of the altitude cure. As I have said elsewhere, an altitude is a bad climate for an invalid fool. To send a sick person to an elevated resort, without due consideration not only of his disease, but his resources and his individual characteristics, is wrong, and when the choice is made it above all behooves the physician to put his patient directly into the hands of a resident physician, not necessarily for medical treatment, but that he may be under the observation and control of a medical guide, philosopher and friend. To do otherwise is as foolish and should be as efficiently punished by the law as would be the offence of handing to an ignorant patient a bottle of strychnin, laudanum, or any other dangerous drug, with the simple instruction that he might, like Betsy Prigg in connection with the bottle on the corner of the mantelpiece, help himself when he felt so disposed.

## DISCUSSION.

DR. E. O. OTIS, of Boston, by invitation, opened the discussion. He paid a tribute to the recent progress made in hematology, and especially acknowledged the work of Dr. Daland and the book of Dr. R. C. Cabot, of Boston, upon this subject. The interesting phenomenon of polycythemia occurring in altitudes as observed and commented on by Dr. Solly suggested to Dr. Otis some doubt as to the genuineness of it. He does not think it is absolutely proven that it is anything more than a peripheral polycythemia. If it is genuine, why on the return to sea-level does not the same condition occur that follows the destruction of red blood-corpuscles in other conditions, as in hemoglobinuria or icterus? Again, if the effect is so remarkable upon phthical cases,

then one would expect, other things being equal, that the higher the altitude the better the results obtainable in treating these cases. In opposition to this he thought the results were not so unequal, for instance, in Davos and Arosa, which are 5,000 or 6,000 feet high, and in Falkenstein, which has an altitude of 1,378 feet. Then, again, if this is a genuine increase in the total number of corpuscles in the blood, one would suppose that a high altitude should be an ideal place for anemia and afford a rapid cure for all such conditions. But, is it proved that anemias improve any more rapidly at high altitudes than at the sea-shore? Does not a patient experience as good results from sea-shore residence as is obtained in the altitudes? For these reasons he believes

there is an element of doubt whether the whole number of blood-corpuscles in the body is increased, and whether it is not a peripheral increase rather than a genuine one. If the latter is true, then of course the benefit of altitude could not be very much. As Dr. Solly says, the conditions under which polycythemia happens is that of feeble oxygen pressure. Helliér, of Bordeaux, made a series of experiments with animals in different atmospheres and with oxygen of various tensions, and found invariably that the number of blood-cells increased when the oxygen was of feeble pressure. But the real cause of this is still in doubt. Some investigators have thought it due to the concentration of the blood from the dryness of the air; but if that is so, why does not the blood take a sufficient amount of moisture for itself from the tissues, as it does in other concentrations? Fick has suggested that it may be a lengthening of the life of individual cells. These explanations are deemed by Dr. Otis to rank only as theories. He asked if it is altogether known what altitude *per se* does for patients? May its chief benefit not be because it affords pure air? If a sanitarium is established in Aiken for example, which is at sea-level, and another at Colorado Springs, 6,000 feet high, under exactly the same methods of hygiene, diet, and treatment, might not similar results be obtained in both cases? As Dr. Dettweiler says, Are not the main conditions a pure air, free from dust and smoke? If the patient can have pure air, be it high or low, free from microorganisms; if he can utilize it constantly from morning till night as is done in the German sanatoria, and also enjoy good hygienic and dietetic conditions, are not the main indications fulfilled? After all, is not this the principal effect of climate?

Dr. Otis closed his remarks by saying that he felt a little doubtful in regard to the excessive value of altitude *per se*, and it also seemed to him that there was a tendency to overestimate the good of the supposed resultant polycythemia. Finally he desired, but had yet to see, a larger number of experiments proving, as an effect of high altitude, that not only the peripheral blood-corpuscles are increased, but the whole number. This has not been proven to his satisfaction, and he thinks the subject still worthy of much investigation.

DR. R. G. CURTIN said that Dr. Solly's paper and Dr. Otis' remarks invited further investigation that would settle the question as to whether the change in the blood was real or only apparent. If the increase in corpuscles was found to be positive, then we might conclude that we have a condition more favorable to the repair of diseased tissues than the factors usually brought forward by climatologists as the curative ones.

DR. F. P. HENRY confirmed previous statements that the peripheral blood at high altitudes shows a greatly increased number of red blood-corpuscles, and said that the pioneer in this form of research was Dr. Paul Bert. Since his time Wolff and others have followed out his investigations and suggestions and they are all of accord that there is increase in the number of corpuscles as one ascends higher. Of course, the principal question is that raised by Dr. Otis: Are the blood-corpuscles in the blood at large increased in number, or are they crowded to the surface by diminished pressure upon the surface of the body? Dr. Henry thinks the weight of evidence is rather in favor of the total number of corpuscles being increased. Pointing to this are researches showing that people going from a plain to a comparatively small altitude, such as 700 meters at Reiboldsgrün, show a marked and important increase in blood-corpuscles, the number rising from 5,000,000 per cubic millimeter to 6,000,000. At the same time there is a diminished percentage of coloring matter in the corpuscles. Then, again, many of the corpuscles are smaller than usual and, therefore, presumably newly formed. These facts incline him to the view that the increase is a real one, and besides Dr. Solly has stated that blood taken from the deeper vessels showed the same increase. He did not know whether the fact that the blood of the lama, an animal inhabiting the highest altitudes, contains 15,000,000 corpuscles per cubic millimeter, has or has not any bearing on the question under discussion. This fact, vouched for by Viault, appears, however, significant. Dr. Solly did not give any data from observations upon himself. If he has submitted to examinations he will be able to tell whether his descent to this low level has produced diminution in the number of his corpuscles. There seems to be no doubt, according to the tables, that there is correspondence between the degree of altitude and

the number of blood corpuscles. This increase is greater in the phthisical than in the healthy, as has been commented on by Dr. Wolff of Reiboldagrün, and this fact lends additional weight to the view that the increase in the number of corpuscles is a real and not an apparent one. Wolff explains the greater increase of blood-corpuscles in the phthisical at high altitudes by the hypothesis that these individuals having less than the normal respiratory surface in their lungs, require that the respiratory surface of the blood (the red corpuscles) be increased inordinately.

The excellence of Dr. Daland's modifications of the instrument of Fleischl and its superiority to other hemoglobinometers were commended; also Dr. Daland's method of making the color-test in the very pale blood of pernicious anemias by taking two or three or four charges of the pipettes so that the color may be deeper and then dividing the result by two, three, or four, as the case may be.

DR. J. B. WALKER said it has long been known that altitude has a peculiar value in lung and heart dynamics; and usually this influence has been attributed to the rarefaction of the air and to its purity—the former causing expansion of the lungs and increased heart-muscle action; the latter aiding in eradicating germ disease. The idea that altitude has a direct influence in hematogenesis by increasing the number of red globules and the amount of hemoglobin is a product of the studies of recent years and places the subject of altitude as a climatic factor on a more substantial basis than anything previously established.

The physician who would benefit his patients by the knowledge thus obtained must, however, bear in mind that all cases cannot be thus benefited by altitude. There must be enough healthy lung-tissue to dilate and meet the requirement for additional pulmonary tissue, and there must also be a heart capable of bearing the brunt of the increased pressure and claims placed upon it. In addition to this the vascular system must not be forgotten and a decided cardiac or arterial change must be considered a contraindication quite as great. Increased cardiovascular activity will not be well borne by such cases, as the various forms of hemorrhages at altitudes clearly establish.

DR. GUY HINSDALE inquired if attempts

had been made to settle the disputed question experimentally. He mentioned the pneumatic cabinet, which permits variations of atmospheric pressure at will, and suggested that if blood-counts of an individual were made in it at pressures corresponding to the sea level and to various altitudes it would show whether the changes in the constitution of the blood or in the number of the red blood-corpuscles were real or merely apparent. An immediate change in the blood-count would point to a peripheral alteration and not to an absolute and general change in the constitution of the blood.

DR. M. PRICE was impressed by the increased expansion of the lung in high altitudes. The benefit of increased lung-expansion was brought to his notice some fifteen years ago by a relative who had marked fibroid phthisis. She had frequent hemorrhages and her lung space was so contracted that she breathed with great difficulty. In removing a tooth the question arose whether it was safe to administer nitrous oxide gas. This anesthetic proved to be not only safe, but beneficial. Her efforts to breathe or to get more oxygen from the anesthetic made a great difference in the expansion of the chest, unquestionably calling into action large portions of lung which had been quiescent or entirely out of use. The relief afforded was so great that for five or six years before death nitrous oxide gas was given periodically to excite forcible expansion. May not the absence of effort to use more of this lung have been dependent on low altitude? The question is, Which are the appropriate cases for treatment by high altitude?

DR. JUDSON DALAND expressed his particular interest in the gain in red corpuscles. He believes there is an actual increase and suggests the experiment of removing blood from a superficial vein by a hypodermic needle. This will permit the observation of blood in veins which can be emptied well out from the thumb and will go far toward solving this problem. He regretted that the charts did not show the percentage of hemoglobin, which has a certain relation to the amount of red corpuscles. Not only the actual amount of red cells and the actual percentage of hemoglobin, but also their ratio is of great importance. Observations in this direction may give new light regarding hemoglobin, as influenced by high



altitudes. The red blood-cells chiefly may be looked upon as hemoglobin carriers, and therefore in high altitudes, where the quantity of air taken per minute must be so much larger than at sea-level, the total amount of hemoglobin required may be greater than under ordinary circumstances. At this level one frequently sees patients who breathe superficially. Frequently reductions of at least 25 per cent. in the amount of hemoglobin may be found. The diminution of red corpuscles was less marked—the loss in corpuscles being about 15 per cent. compared to a 25 per cent. loss of hemoglobin. Dr. Solly's results in phthisis at high altitude are of particular value. The effect of altitude upon the mere mechanics of the lung, as noted by Dr. Price, is perhaps one of the most important factors in pulmonary conditions. The demand for oxygen necessitates continuous involuntary lung gymnastics. Would it not be of advantage to change totals of bulky figures of millions, seven millions and the like, to percentages. To do so would make the entire subject very much clearer to the hearer and reader.

DR. OTIS here mentioned the interesting fact communicated to him by Dr. Cabot, that in the Java mountains, 5,700 feet high, the increase in red blood-corpuscles has not been found by Kohebrugger to take place; he does not know whether other observations have been made in altitudes of similar latitude, and Lepine thinks Kohebrugger's instruments might have been imperfect.

DR. S. SOLIS-COHEN invited attention to the observations of B. W. Richardson, Paul Bert, Waldenburg, and others, who have worked in pneumo-therapeutics, since these answer Dr. Hinsdale's questions fully. After oxygen has been given to man or animals for a long while the number of red blood-cells increases because of the adaptability of the organism to environment. When it is continually forced to dispose of more oxygen than normally it produces more oxygen carriers. The immediate effect of sittings in pneumatic chambers or inhalations of compressed air is to increase slightly the number of red cells temporarily in the peripheral circulation, but the continuous effect is to increase markedly the constant number of red cells. The mere pressure effects are therefore not great, but after pressure has been employed for a sufficient time to bring into use areas of lung tissue

ordinarily kept out of use, so that by degrees the patient habitually takes longer breaths and inhales more oxygen, more hemoglobin is needed and is produced by increase of blood-cells. Thus *a priori* and experimentally, so far as observations at sea-level are concerned, all that Dr. Solly has said seems intrinsically probable; namely, that the observations quoted show an actual increase of the number of oxygen carriers in the blood. Further, it should be remembered that in normal individuals this is simply an adaptation of the organism to the new external conditions. The reduced oxygen-tension in a rarefied atmosphere diminishes the quantity of oxygen that can be taken up by each individual cell, and the increased number of cells is compensatory. If the product of oxygen and hemoglobin is 100 at sea-level it is still only 100 with the increased number of oxygen-carriers at the altitude. In the normal individual, therefore, the increase of red cells simply puts him back to the point where he started. During his first days at the altitude he is relatively anemic. Creighton, 1887, in commenting upon Bert's observations, called attention to the fact that much of the permanent good in pulmonary tuberculosis was due to the fact that having to increase the number of corpuscles in order to take up increased amount of oxygen at each respiration, the reparative process thus initiated continued until complete harmony existed between the organism and its environment; and that when the phthisical patient returned to the level he took with him this increased number of corpuscles as a distinct gain. Dr. Solly's remarks seem to carry this observation still further, and to say that this advantage in the bad cases will last only for a month and in the better cases will last for a longer period. There is no question that altitude furnishes, in certain cases of disease, many therapeutic advantages which cannot be obtained otherwise. There is also no doubt that the physician who sends his patient to an altitude to get these therapeutic advantages must have a distinct idea of what they are and their fitness and unfitness for the particular case. Much disappointment awaits both patient and physician from indiscriminate recommendation of altitude or other climatic conditions. Dr. Cohen confirmed from his own experience the importance of the suggestion that the

patient should go to a physician first and scour the plains afterward. Those who take medical advice and are guided by it in every particular do well, and those who simply trust to their own devices or the counsel of their friends usually do not.

DR. B. A. RANDALL inquired whether experiment has determined if the increase in red corpuscles following massage, noted by Dr. Mitchell, occurs also under these circumstances. As that is probably in large part a peripheral variation, its occurrence or not would indicate whether the increase in question is constitutional or peripheral.

DR. SOLLY closed the discussion and expressed his regret that Dr. Otis' statements were twice in error: First, when he said the results obtained from treatment in sanatoria were as good as those obtained by altitude treatment. That this is not correct can be seen, says Dr. Solly, by study of the literature of the subject, and he refers to the same authority for proofs of his other statements. In fact, the results obtained at Goerbersdorf and Falkenstein, while better than in the usual cases treated in similar climates and elevations in open resorts, are inferior to those obtained from the American sanatoria, probably because, unlike the latter, desperate cases are admitted, whereas in American sanatoria only hopeful cases are received; but even in these institutions the results are inferior to the altitude results except when the sanatorium is situated in a high altitude. Because he felt the reports from European sanatoria did not do those admirable institutions justice, he omitted them from the chart, but he can give their statistics if desired, and he has a high opinion of sanatoria.

The large majority of the reports from which his chart showing the percentage of those benefited in the various classes of climates was made came from the physicians who had sent the patients away, and if the gentlemen at the meeting took notes of their

cases and followed them up, they would know these things from their own experience instead of needing a health-resort physician to come and prove them. The European physicians have set a good example that it would be well to follow.

Dr. Otis objects that the corpuscular increase is of no value because it is merely peripheral. It has been proved by experiment to be through the entire circulation. For the evidence Dr. Solly refers to Paul Regnard's recent most valuable work on altitude. It contains not only a full account of his own experiments, but a summary of most of the work done on the physiologic effects of altitude. In the book is a chart showing the rise in the curve of hemoglobin moving *pari passu* with the corpuscles and the height of the land. Dr. Solly regretted that he did not present this chart and so comply with Dr. Daland's desire. It is known that in cold countries the spread of the germ is limited, but not in the same degree as in a high climate. Consumption can be acquired at high altitudes, but not nearly to such extent as elsewhere, as is shown by reports from Denver and Colorado Springs. If comparison is made with the statistics of mortality from phthisis in other cities of the same size the contrast is astonishing. This immunity exists in spite of the lack of hygiene, of over-crowding and of the large influx and concentration of consumptives.

Expansion of the chest is undoubtedly a valuable result of high altitude. In cases of fibrosis the advisability of resort to an altitude depends upon the stage of the disease. When it is extensive the case is better away from the high altitude, where it will suffer more extremely; but cases of limited fibrosis are benefited because the rest of the lung expands and takes up the action which the fibrosis prevents in the affected portions.

## A PLEA FOR THE NATIONAL FORMULARY.

BY F. W. E. STEDEM, PH.G.

Read May 11, 1898.

At a recent meeting of the Philadelphia College of Pharmacy a committee was appointed and instructed to seek an interview with the County Medical Society of Philadelphia. The object of that interview was to bring the National Formulary to the more intimate notice of the physicians of Philadelphia. We are here to-night for that purpose. After the final meeting of the Committee on Revision of Pharmacopœia at the sixth decennial revision Dr. Chas. Rice, of New York, advocated the adoption of some standard set of formulæ for the making of such preparations as elixirs, sirups, emulsions, etc., not admitted into the Pharmacopœia. The matter was taken up by the various pharmaceutical and medical societies of New York and Brooklyn, and as a result of their deliberations the New York and Brooklyn Formulary was published in 1882. Two years afterward the matter was taken up by the American Pharmaceutical Association, and after mature discussion, the work of the former bodies was adopted and enlarged with the National Formulary as a result. We come before you prepared to show some of the finished products of those formulas and to advocate their use and to make a plea for the work in general.

The following letter was received from Mr. Beringer:

CAMDEN, N. J., May 10, 1898.

MR. F. W. E. STEDEM.

MY DEAR SIR:—I regret that it will be impossible for me to attend the meeting arranged for Wednesday evening. I know of no more striking illustration of the need of a standard formula that shall receive the *authorized recognition* of both physicians and pharmacists than occurs in "Compound Syrup of the Hypophosphites." Probably

every physician prescribes frequently *syrupus hypophosphitum compositus* without other designation. If the prescription were presented to a dozen pharmacists it would probably be dispensed with almost as many different formulæ. Yet each compounder would be honest in his intent and acting in accordance with the light which he possessed.

In conversing with brother pharmacists on this subject I learn that some are dispensing the pharmacopœial syrup of the hypophosphites, others the official syrup with iron, others the National Formulary Compound Syrup of the hypophosphites containing in addition to the hypophosphites some tincture of *nux vomica*, and others dispense a *cloudy* syrup containing the alkaline hypophosphites combined with iron manganese, quinin and strychnin, and still others a *clear* syrup of similar composition.

Inquiry among physicians, in order to learn their intent when writing for *syrupus hypophosphitum compositus*, gave answers quite as varied as that of pharmacists.

An examination of the price-lists of four of the leading manufacturers more forcibly emphasizes the lack of uniformity.

On these four lists I find 21 compound syrups of the hypophosphites. Eliminating 5 formulas, common to the four lists, and we have remaining a medley of 16 formulas showing very marked differences in composition. One formula claims only  $5\frac{1}{8}$  grains of hypophosphites per fluidounce, another 8 grains, another 28 grains, one 32, one 34, one 36, several 40, one 42, one 44, and one 48 grains. This shows a variation from  $5\frac{1}{8}$  grains to 48 grains, the latter being nearly five times the strength of the weaker. Those containing quinin vary, for this ingredient, from  $\frac{1}{2}$  grain to 8 grains per fluidounce, and those containing strychnin vary from  $\frac{1}{16}$  to  $\frac{1}{2}$  grain.

These varying formulæ are not unattended with danger to life. It is quite common indeed for the physician to order in combination with compound syrup of the hypophosphites, strychnin or nux vomica. If such a prescription be compounded with a compound syrup containing  $\frac{1}{4}$  grain strychnin to the fluidounce, an excessive and dangerous dose might be administered.

The above is not a fancy picture, but only

one of the perplexing questions that indicates the desirability of an interchange of opinion between physician and pharmacist, and an acceptable settlement of such problems as shall protect both their interests.

Wishing you success in bringing these matters before the meeting, and pledging my assistance if desired in the future, I am,

Yours very truly,

GEORGE M. BERINGER.

## NATIONAL FORMULARY PREPARATIONS.

BY W. L. CLIFFE, Ph.G.

Read May 11, 1898.

MR. STEDEM has given you the history of the origin and compilation of the National Formulary, and it is proposed to demonstrate with the aid of some of the individual preparations the advantages of this class of formulæ over those open formulæ exploited by proprietaries in the advertising pages of the medical journals and through the missionary labors of suave and genial "representatives." It will no doubt be regarded as a more frank and manly course to state that the impetus behind the work of this committee is the same as that which impels the specialty manufacturer; for every retail pharmacist worthy of the title is a manufacturer himself, and one more fitted by training, contact and personal knowledge of your needs to prepare for you the weapons for fighting disease than a corporation or individuals with whom you have no business or personal affiliation. We feel sure that logically and practically our position is sound and correct.

It is well known to us that your old and honorable society has maintained that it is contrary to the ethics of your profession to use remedies of unknown composition; but, gentlemen, the modern business man is always insidious in his methods, and the chances in the game of business are largely in favor of the smartest exponent of these methods, with cash to spend for printer's ink, and to insensibly but surely move things his

way. The ethics of business might be crystallized into the laconic "get there."

Pharmacists and physicians are trained in a broader and less selfish school. In the use of proprietary specialties the patient is compelled to pay the bills for advertising and detail work plus a good profit for both manufacturer and dispenser, and for what purpose? Simply to receive a product that has no therapeutic or pharmaceutical advantages over a similar one readily obtainable by collaboration with the pharmacist at the elbow of the physician.

Another not unimportant matter is the relative position of the specialty owner and pharmacist under existing laws. The control of the specialty is solely vested in the owner, and it would prove an extremely difficult matter to hold him responsible for any changes that caprice or greed might dictate; while the pharmacist is held strictly accountable to the authorities for any violation of the standards of the U. S. Pharmacopeia or the National Formulary.

With your kind permission I will now briefly call your attention to specimens of some of the more prominent compounds which, judging by the popularity accorded to them, supply a need of the busy practitioner, who can prescribe them under a single title. (Mr. Cliffe exhibited a number of preparations.)

## SODIUM PHOSPHATE SOLUTION.

BY JOSEPH W. ENGLAND,

Read May 11, 1898.

THE limited solubility of the official "crystallized" sodium phosphate—about 10 grains to the fluidram of water, at ordinary temperature—and the much less solubility of the "dried and powdered" salt of commerce—often used—which is the crystalline salt minus its 60.3 per cent. of water of crystallization, has militated somewhat against the more extended employment of the compound, although its use has rapidly grown in recent years. The so-called "granular" form is more convenient to handle than the crystalline, but it contains almost as large a percentage of water and, as efflorescence of salt readily takes place on exposure to air, water is lost, and the percentage of active ingredient becomes indefinite.

The advantage in using the dried and powdered salt rests in the fact that it contains only about 1 per cent. of water, and the loss of water, if any, is within very narrow limits.

Various formulæ have been proposed for making solutions of sodium phosphate. The one most generally employed is that of a "solution of citro-phosphate of sodium," originated by William C. Wescott (*American Journal of Pharmacy*, 1896, 256), as a result of his analysis of a widely-advertised proprietary preparation, claimed by the manufacturers to contain, in each fluidram, 85 grains of combined sodium phosphate, citric acid, and sodium nitrate.

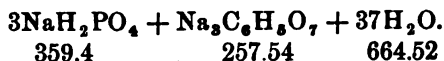
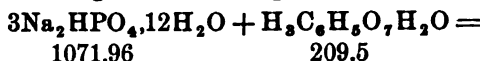
Wescott's formula is as follows:

Sodium phosphate, crystals.	7 ozs. (Troy) 290 gra.
Citric acid.....	475 grains.
Sodium nitrate.....	73 grains.
Water, a sufficient quantity to make.....	8 fluidounces.

Triturate the salts and acid until they liquefy, and add the water.

Now, it will be noticed that, in this formula, the proportion of citric acid used to anhydrous phosphate is very large relatively, i.e., about one-third. 3650 grains of crystalline salt should yield 1449 grains of anhydrous salt, and for this 475 grains of citric acid is directed.

The question that naturally arises at this point is, "What chemical change ensues in the making of this preparation?" In the writer's opinion, part of the official sodium phosphate, or acid phosphate, is changed into sodium diacid phosphate, and sodium citrate, according to the following reaction:



If this theory be correct, it will be seen that a part of the sodium phosphate is changed to sodium citrate. Assuming that the reaction given is correct, it will be found by equation that, in the 8 fluidounces of solution, 475 grains of citric acid are changed to 584 grains of sodium citrate, or about 9 grains of the latter to each fluidram.

The question that we, as pharmacists, should like to ask of you, as physicians, is this, "Whether or not the presence of sodium citrate and of sodium nitrate is ever contraindicated, therapeutically, when the use of sodium phosphate is indicated?" If they are, then a formula should be devised, whereby this objection shall be eliminated.

For more than a year past, the writer has used in the Philadelphia Hospital a formula which he thinks overcomes such an objection, if it exists. The following is the formula used, and is slightly increased in the proportion of its ingredients over the original formula:

Sodium phosphate, dried and powdered.....	3 ozs. (Troy) 96 gra.
Acid, phosphoric (50 per cent.).....	1½ fl.ozs. (921 gra.).
Water, a sufficient quantity to make.....	8 fluidounces.

Dissolve the solids in the water, which has had the acid previously added to it, and filter through paper.

Especial care should be taken to use the nearly anhydrous "dried and powdered" sodium phosphate and *not* the "granular"

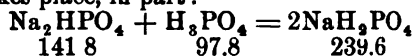
salt with its 57 per cent. of water, or the resulting preparation will be excessively, and possibly dangerously, acid. If desired, the 85 per cent. acid, of the U.S. P., '90, may be used in place of the 50 per cent., employing a proportionately less quantity (*i. e.*, 542 grains). The 85 per cent. acid should be always weighed, however, and not measured, in order to ensure greater accuracy. Its great density increases possibility of error in measuring, unless checked by weighing.

The dose of this preparation of sodium phosphate is one to two teaspoonfuls in a wineglassful or more of water, preferably hot, three times a day, one hour before eating. If taken cold it may be made very acceptable by the addition of about ten grains of sodium bicarbonate (baking soda), when effervescence of carbonic acid gas ensues, and a grateful vichy-like solution results. If the volume of the dose be objected to, a teaspoonful or more of the solution diluted with an equal volume of water may be given, followed by the wineglassful or more of water. But, on therapeutic grounds, a relatively larger volume of water should always be given coincidentally with the dose.

As thus made, the solution of sodium phosphate is a clear, transparent, faintly acid liquid, slightly heavier than official sirup, having a cooling saline taste, mixing with water unchanged in all proportions, remaining liquid at ordinary temperature, and yielding to each fluidram, on evaporation to

thorough dryness, about thirty grains of anhydrous salts.

In the making of the solution, the writer believes that the following chemical reaction takes place, in part:



In other words, the official sodium acid phosphate becomes partially sodium diacid phosphate—just as occurs, probably, in following Westcott's formula—while the larger proportion remains the official sodium acid phosphate, but with the difference, that no sodium nitrate or citrate is present, or is formed.

Clinical results have shown that no difference in effectiveness results from the presence of the diacid salt with acid salt. If any objection existed to this, it could be readily met by the addition of sodium bicarbonate to each dose—as suggested above—whereby the diacid salt is alkalized to the official acid salt.

The official sodium phosphate in solution, while chemically an acid salt—in that its molecule contains replaceable basylous hydrogen atoms—is physically alkaline in reaction. On the other hand, the diacid sodium phosphate is acid both chemically and physically, while the remaining salt of the groups of orthophosphates—the normal sodium phosphate—is alkaline in reaction, and its solution, exposed to air, absorbs carbon dioxide to yield sodium carbonate and the acid phosphate.

## DISCUSSION.

DR. H. A. HARE opened the discussion, commending the joint character of this meeting of pharmacists and physicians and the opportunity it afforded for mutual understanding and harmonious action.

From the physician's point of view, he condemned the introduction of the National Formulary and considered it practically an announcement that pharmacists had organized themselves into a body for the dispensing of compounds to patients without any prescription for them by physicians.

He believed the National Formulary has driven the profession to dispensing drugs themselves for the purpose of combating

the counter-prescribing druggist. He gave instances to show that the latter evil is widespread and said the pharmacists failed to recognize that physicians are no longer desirous of prescribing shot-gun prescriptions, and that when they wished to combine a number of ingredients they tried to be well enough educated to know the exact quantities they wished, and that it was desirable to vary the proportions of the ingredients according to the needs of the patient. Inability to vary the contents of a prescription is exceedingly disadvantageous to the progress of the physician as well as of the patient. An objection to such combinations

is it does not permit an increase in the dose of one ingredient without likewise enlarging that of the others. It is a well recognized fact among physicians that many compounds of iron, phosphates, etc., now in the drug market, are no more useful than a sirup of iron iodid, or at the most than 4 or 5 official preparations of iron which are commonly employed by physicians. The introduction of alkaloids and concentrated preparations of drugs has, to a large extent, limited the employment by physicians of the liquid preparations shown at this meeting. Patients at the present time prefer medicine in the form of gelatine-coated affairs, etc., rather than liquid preparations. Druggists must all recognize that manufacturing chemists (among whom are undoubtedly some honest and capable men) buy such enormous quantities of crude drugs at a small price, and have such facilities in the matter of chemists and equipment to analyze their products, that the latter are considered by the physician and many pharmacists not only to be exceedingly reliable, but in many instances to be cheaper for the pharmacist to purchase than to prepare. The analysis of drugs is one of the most important questions that can come before the professions of pharmacy and medicine. In instance of this, Dr. Hare mentioned that he purchased tincture of *nux vomica* at five of the representative drug stores of this city. Twenty drops of these tinctures represented such widely varying quantities of contained strychnin and brucin that while the weakest sample could scarcely hope for therapeutic result, the strongest would produce, in the susceptible, mild symptoms of poisoning. One preparation contained nearly four times as much as the other. The difference depended upon some lack of skill, or a greater skill in making the tincture, or more likely, one man obtained a *nux vomica* bean which contained a great deal of alkaloid, while another procured one which held very little, and, aside from chemical analysis, both sets of *nux vomica* beans look almost exactly alike. Another objection to compound preparations is that many of them are prescribed by physicians without a very definite idea of what they contain, and by others without knowledge of what they will accomplish, aside from what the druggist has seen fit to print on his label. The whole question comes down

to the interesting fact that the old shotgun prescription has been replaced by the rifle-ball remedy of to-day, consisting of one or two alkaloids in concentrated form.

It is a pity physicians do not more frequently consult with their druggists. Most physicians know that the majority of their prescriptions go to two or three particular druggists. If physicians would occasionally get the views of the druggists who put up their prescriptions upon the best vehicles to prescribe, the profession of pharmacy and that of medicine could determine together the way to give remedies. The dose quantity in the compound mixtures would be markedly modified if the formulary was prepared with the aid of a physician's experience.

A word as to technic. Mr. England directed that a large quantity of water should be given with sodium phosphate. This is distinctly in contravention to the view recognized by the profession. It has been proved by physiological experiment, that in giving a saline purge it should be in concentrated form, that the saline may extract fluid and produce a watery stool. If any saline is diluted beyond 7 per thousand its purgative action is spoiled, and this is true of the *seidlitz* powder.

Finally, in the wholesale drug-house there are different cases containing different grades of drugs, and the retail druggist will buy according to his honesty; of course, the result will be that some preparations are dispensed which are good and others which are not good. Experience increases the conviction that when remedies fail, it is because the prescription is not put up with the same ingredients the second time that it was on the first occasion.

Dr. G. BETTON MASSEY had seen it stated that Dr. Oliver Wendell Holmes went to his druggist to learn what was best going at that time for his ailment. Dr. Massey agreed in part with Dr. Hare and advocated the palatability of remedies. He placed the responsibility of the shot-gun method of prescribing with the medical profession. The effort of the druggist is to lessen the list of methods of filling these shot-gun prescriptions. He had on that day an instance of the poisonous effect of strychnin in a preparation mentioned at the meeting. It is more than likely that many cases in Philadelphia are given too much of the active ingredients in compound prescriptions. But the fault

does not lie with the druggist, but at the door of the physician who should know that, by prescribing simple remedies and watching the results, success was best attained. Dr. Hare's defence of the large manufacturer did not entirely cover the ground. Much that he had said must be true. They can furnish a reliable preparation, but the responsibility of the miscarriage of a single dose cannot be traced to the manufacturer in a distant city. If this can be made clear as well, we should prescribe their preparations.

Dr. H. A. HARE here stated that he did not say the druggist was responsible for the shot-gun prescriptions, and that he attempted to make no defence of the manufacturing pharmacist.

MR. F. W. E. STEDEM said Dr. Hare has made the best defence of the Philadelphia College of Pharmacy that its members could desire. The Code of Ethics of the College declares:

1st. *The College of Physicians of Philadelphia* having declared that any connection with, or moneyed interest in, apothecaries' stores, on the part of physicians, should be discountenanced; *we in like manner consider* an apothecary being engaged in furthering the interests of any particular physician, to the prejudice of other reputable members of the medical profession, or allowing any physician a percentage or commission on his prescriptions, as unjust toward that profession and injurious to the public.

2d. As the diagnosis and treatment of disease belong to the province of a distinct profession, and as a pharmaceutical education does not qualify the graduate for these responsible offices, we should, where it is practicable, refer applicants for medical aid to a regular physician.

3d. As the practice of Pharmacy can become uniform only by an open and candid intercourse being kept up between apothecaries, which will lead them to discountenance the use of secret formulas, and promote the general use and knowledge of good practice, and as this College considers that any discovery which is useful in alleviating human suffering, or in restoring the diseased to health, should be made public for the good of humanity, and the general advancement of the healing art—no member of this College should originate or prepare a medicine, the composition of which is concealed from other members, or from regular physicians.

Wherever the influence of the College is felt, the practice of counter-prescribing is denounced as thoroughly as it could be by any physician in Philadelphia.

The tincture of *nux vomica* is an official preparation, recognized by the Pharmacopoeia.

This says the extract of *nux vomica* should be taken and dissolved in an alcoholic medium. It should contain 2 per cent. of dry assayed extract of *nux vomica*, and furthermore states that this dry extract should contain at least 15 per cent. of combined alkaloids. There is no excuse for any drug store in any section of the city making tincture of *nux vomica* in any way except by the official method. If Dr. Hare will examine any manufacturing concern in Philadelphia or any other city, he will find every department is not in the hands of skilled chemists, though some are. There are manufacturing establishments in Philadelphia which employ boys of 12 and 14 years of age to do the mixing and sifting, and boys of not more than 16 and 17 years of age to do the actual weighing, and there is not one single registered pharmacist in any department, except the manager of the department. There is not a drug store in Philadelphia of any repute which does not employ clerks, who are known as qualified assistants. A great many of them employ only clerks with manager's certificates. A case is pending in court because a physician prescribed 100 pills containing a certain amount of strychnin, and directed his patient to procure the product of a well-known Western house. The patient took half the pills and suddenly became sick from strychnin poisoning. The pills that occasioned the trouble were taken from a lot of 40,000 and the druggist is looking to the manufacturer for a settlement of the case. If the physician had ordered 100 strychnin pills and had ordered so much strychnin made into 100 pills and said nothing about the manufacturer, his patient would probably have received a very carefully prepared pill from the druggist.

Samples of the elixir of potassium bromid, of dissimilar color and appearance, purchased by Mr. Stedem at several drug stores were exhibited by him in illustration of the necessity for a National Formulary on grounds of uniformity in elixirs. Pharmacists do not pretend to say that physicians must order these preparations. It is the aim of the pharmacist to supply what is demanded. It is for the physician to say what is of use. It is the business of the pharmacist to try to be a help to the physician, and it is the desire of the pharmacist that the physician should understand this—



and also that the pharmacist invites the physician's criticism, and in return would be recognized for what he, the pharmacist, wants to be and what he is in reality. It must be admitted that there is some counter prescribing. There are some drug stores kept by doctors who make no charge for medicine, or there is a charge for medicine and no charge for advice. Pharmacists cannot prevent many things that seem to be wrong. What they ask is that physicians should meet them half way and give them a chance, and then it will be demonstrated that pharmacists are perfectly right.

DR. HARE asked of what advantage is the elixir of potassium bromid?

MR. STEDEN replied that the pharmacist did not pretend to say. Physicians prescribed it and other preparations for which the pharmacist did not know the reason.

MR. J. W. ENGLAND, in reply to Dr. Hare's remarks on the manner in which sodium phosphate solutions should be given, said that he did not wish the method described in his paper to be considered as original. It is the routine practice followed, in the Philadelphia Hospital, by the order of the Chief Resident Physician. Mr. England did not desire to pose as a therapist, but thought that sodium phosphate is not analogous to sodium sulphate, the question of concentrated or diluted administration was outside his province. He reinforced Mr. Stedem's denial of the alleged superiority of manufacturing pharmacists to retail pharmacists. He stated that the Pennsylvania State Pharmacy Law does not require manufacturers to employ qualified help. The State Law demands that the retail druggists shall do so, but is entirely silent as to manufacturers, who employ the cheapest help they can get, excepting the skilled heads of departments. In contrast, the retail druggist is thoroughly skilled in his calling. The alleged advantage of manufacturers buying large supplies of drugs with ability to sell at a lower price is counterbalanced by the doubt of proper drug preparation. There is a likely risk to be considered in accepting manufacturers' products, and chemical analysis has not advanced enough to give enormous advantages on this account to manufacturing pharmacists.

MR. GEORGE CLIFFE inquired if Dr. Hare remembered any particular instance, outside of fluid extracts, in which the cost of drug

preparation was less to the manufacturer than to the retail druggist.

MR. BORING stated that retail druggists are in a better position to get drugs of good quality than the large manufacturer, who gets them in gross bulk with stones, dirt and other impurities.

DR. JOHN B. TURNER expressed his pleasure in being a graduate of the College of Pharmacy and predicted that as long as physicians will use fancy preparations, so long will druggists prepare them. He thought the National Formulary a good idea, and advocated uniformity. He sided with the druggist in preference to the manufacturing pharmacist. Any druggist, no matter how small, can put up drugs if he is honest, and he can procure small quantities of the best materials. Dr. Turner does not object to counter prescribing and would rather have druggists prescribe than have patients buy patent medicines. The products of manufacturing chemists are really patent medicines under cover. The National Formulary is a point well taken.

DR. S. SOLIS COHEN corrected one statement made by Mr. Stedem. While a prescription calling for a grain of strychnin to be made into 30 pills would be so prepared in Mr. Stedem's store, yet in many shops a ready-made pill would be taken from stock. Dr. Cohen has had to add gentian or some inert substance to such a prescription, so that the druggist must, to fill it, make the pills. This whole business of ready-made pharmaceutical preparations, for which the manufacturing chemists are very largely responsible, is one of the gravest difficulties to be contended with at present in the practice of medicine. It does not lead to greater accuracy, for if the weighing be done, as stated, by an untrained boy, it is not so likely to be correct as when done by a man who has been compelled to take a severe course of training in chemical manipulations and pharmaceutical theory. It makes no difference whether large or small quantities be used, whether the mass be divided into 40,000 or into 40 pills, the greater the skill of the one who weighs and divides, the more likely is a good result; this notwithstanding the introduction of machinery into the process. The responsibility for ready-made mixtures containing a great number of ingredients, is distinctly upon the shoulders of the medical profession. The reason druggists

prepare these articles is because the doctors prescribe them; if they did not, the stuff would remain upon the druggist's shelves. There is little sale for individual patent medicines. No druggist can make a fortune by simply preparing an elixir of potassium bromid or a compound sirup of hypophosphites and selling it over his counter. The only way money can be made in that business is by spending large sums in advertising. From a patent-medicine standpoint, there is nothing to induce the druggist to make these preparations, and it is simply in order to fill the foolish prescriptions of physicians that such of these formulæ as have no merit have come into existence. Many of them, however, have distinct merit.

The advantage of agreement between physicians and druggists concerning such preparations as are likely to be used and are not in the Pharmacopeia, is too great to be hastily cast aside. Dr. Hare's suggestion that in the preparation of the National Formulary, physicians should be consulted is wise. Indeed, this has been done to some extent. Accuracy is the main question. When the physician, for example, prescribes the compound sirup of hypophosphites, he should mean, and the druggist understand, a preparation containing a definite quantity of known ingredients, and not have the uncertainty of choosing among preparations varying greatly in composition and strength. One thing leading to confusion in this particular instance, is that the official sirup of hypophosphites of the United States Pharmacopeia used to be called compound sirup. Most physicians who prescribe the compound sirup of hypophosphites have in mind the United States Pharmacopeia formula of 1880. Druggists should make it a rule, when they are in doubt, either to ask the prescriber or to dispense a Pharmacopeial preparation rather than to attempt to guess one of the 40 formulæ cited.

There is another point of paramount importance. The journal with which Dr. Cohen is connected, in discussing the preparation of tinctures and infusions from fluid-extracts, editorially expressed the opinion that a needed revision of the pharmacy law was one that would place manufacturing houses under supervision and require them to have all the processes carried out by skilled persons. The conditions of the trade are such that we cannot expect it to take the step

backward that we might desire. Personally, he would prefer to have the drugs that his patients use selected in their crude state by a competent pharmacist, and by such an one carried through the various manipulations resulting in the finished product that goes to the patient. But it is well known that while many trustworthy pharmacists of this city do that, the vast majority do not; and the question is how to get the best results under present conditions. Dr. Cohen has found it necessary in visiting different parts of the city, to ascertain as far as possible to what druggists the prescription is likely to go, and when it is to a druggist who needs no specifications, as a rule he sends none. But when he has reason to believe that the druggists are in the habit of purchasing from certain manufacturers whose reputation is not of the best, or who sell the cheapest goods, he has thought it advisable to specify the preparations of manufacturers in whom he has confidence. This is done for the protection of the patient, not against the pharmacist, but against the second-rate manufacturer with whom the pharmacist might have dealings. Unless some step is taken to bring the manufacturing houses into a direct, responsible relation with the profession, which they do not have at present, he thought less and less satisfaction would be obtained from most prescriptions for drugs, other than alkaloids or definite chemicals.

DR. HARE, in reply to the question asked by Mr. Cliffe, said it seems a self-evident fact that the man who makes 40,000 pills can sell them cheaper than the man who makes 40 pills.

MR. CLIFFE replied, the question is not whether the man who made 40,000 pills did or did not make them cheaper than the man who made 40; but whether he supplied them to the druggist at less cost than the latter could prepare them. Mr. Cliffe then stated that as a practical pharmacist he can send out a prescription for quinin pills, made by himself individually, for less money than he can send out a manufacturer's preparation.

MR. STEDEM confirmed Mr. Cliffe's statement, and gave as an instance of the unreliability of manufacturers, that he assayed a fluid extract of rhubarb made by a large house and found that it assayed less rhubarb than the tincture. In closing, he reiterated his plea that it was the desire of the pharmacist to be of use to the physician.

## TWO CASES OF CARCINOMA SUCCESSFULLY TREATED BY THE ELECTRO-MERCURIC METHOD.

BY G. BETTON MASSEY, M.D.

Read May 11, 1898.

MRS. B., aged 66, had the right breast removed for carcinoma of a malignant type in January, 1897. Ten months later she came under my notice with seven carcinomatous nodules which had developed in the course of a lymphatic vessel, which extended in a line from the scar upwards towards the clavicle. These growths were the size of hazelnuts, were in the subdermic tissues, and were rapidly increasing in size.

On the 11th of December, 1897, she was placed under ether and, with the assistance of her physician, Dr. Ida E. Richardson, and of Dr. Willard Thompson, the cataphoric method was applied by means of three small gold electrodes amalgamated with mercury, the electrodes being so inserted as to include all seven of the growths in their field of influence. Before turning the current on an excess of metallic mercury was injected through the electrodes in order that an abundance of this metal would be in proper situation for cataphoric dissemination throughout the growths. The current was now turned on without shock, the active electrodes being positive and a large pad on the back negative. Before the full current employed—500 milliamperes—had been turned on there was evidence of change in the growth surrounding the electrodes, and by the expiration of fifteen minutes all of the growths had been softened and an area beyond them infiltrated and changed to a grayish hue. The application was complete at the end of fifteen minutes, when the current was turned off and the patient put to bed.

The application in this case was followed by considerable pain, lasting four hours, but it ceased at the end of that time and the patient was thereafter comfortable.

The spot was dressed with a dry powder

and remained in an aseptic condition until the debris came away, some two weeks later, after which it healed by granulation. No further treatment was required, and the patient is now well, with no evidence of unsound tissue anywhere. The axilla remained uninfected in this case, both at the time of the removal of the breast and when she came under my notice.

The second case to be reported this evening was an instance of carcinoma of the sublingual salivary gland on the left side, in a woman 56 years of age, who had noticed the lump for six months, during which time it had grown rapidly. For two months it had caused her excruciating pain, day and night, and she had been latterly quite unable to take nourishment. On examination the lump was found to be the size of a horse-chestnut, its center was occupied by an ulceration which emitted a horrible odor, so strong indeed as to affect the air of the whole house when she was admitted to the private hospital.

On the 28th of December last she was etherized and the electro-mercuric method applied with the assistance of Dr. S. J. Gittelson. A large gold electrode, well insulated to near its tip, was thrust into the center of the growth and 400 milliamperes turned on, an abundance of mercury having been injected about it. As the current used was not very strong the application was prolonged to thirty minutes. The indurated base and surroundings of the tumor seemed softened by this time.

During the passage of the current it was noticed that the odor had ceased, and it never returned, though grayish shreds remained in the situation of the tumor until thrown off by nature about two weeks later. The intense pain from which this patient

suffered was also found to have ceased by the next day, and it never recurred. A slight additional application was made three weeks after the first to a portion of the growth that had escaped the original application. The bared area gradually healed by granulation, and I have the pleasure of exhibiting the patient to night in a state of perfect health so far as this trouble is concerned. [The patient was exhibited.]

The diagnosis of the first case was corroborated by a microscopic examination when the breast was removed. In the case of the patient exhibited this was accidentally omitted, as the small piece removed by me for this purpose was mislaid by the pathologist and lost during an attack of illness. The clinical features of this case were nevertheless so pronounced as to leave no doubt of its malignant nature.

### DISCUSSION.

DR. G. G. DAVIS expressed his interest in the non-operative treatment of carcinoma, and his belief that it would yield better results in many cases than excision. Although it is a common practice of surgeons to excise cancers, as of the lip, many of these can be cured with less distress to the patient and less liability to recurrence by the use of such caustics as chromic acid. The electro-mercuric method appears to work upon the same lines. In certain cases of carcinoma, if the disease can be treated at its base and killed while in the tissues it is more apt to be cured than if excision is attempted. In carcinomata, infection extends in very diverse lines, that is, a simple incision frequently fails to include all the infected tissues and therefore recurrences ensue. If in the use of conservative methods an infected spot escapes detection it will show itself when the main portion is eradicated and attention can then be directed to it. The frequent failures of excisions to remove all foci in breast cases prompted a German surgeon to the introduction of a more extended operation. His example has been followed by others, and most recently by Halstead. A distinct advantage of the conservative method when contrasted with the operative procedure, is that it is less likely to provoke disturbance in the neighborhood of the growth and a violent subsequent course.

DR. G. BETTON MASSEY was originally induced to employ the electro-mercuric method by the reported and undoubted successes obtained by caustics. Enormous amounts of current may pass harmlessly through the body if properly disposed on the surfaces. With the employment of zinc poles and the addition of mercury it is the

most caustic and efficient method of treating carcinomata. The destruction is far greater than with mercury alone. The use of mercury alone is very satisfactory to small tumors and is made possible by the gold electrode. The important advantage in the use of electricity is the formation of the active material in situ by cataphoresis. The material may be carried further than is possible by ordinary osmosis which is increased to an illimitable degree by cataphoresis. By this method the caustic action follows the lines of possible prolongation of the growth, if, as is usually the case with carcinoma, the prolongations are better conductors than are the surrounding tissues. Excepting scirrhus, the average cancer is a cellular mass and hence a good conductor. Sufficient use of the material should ensure the destruction of all local carcinomata. The belief that cancer is a parasitic disease and that cut surfaces may reimplant it is supported at the present time by some facts. This explains Dr. Davis' remarks and the superiority of this method in certain cases to that of the knife. There is no possibility of recurrence in complete excision except by accidental contact of the cells of the part excised with a portion of the surrounding healthy tissue.

DR. JOHN C. DACOSTA inquired if microscopic examination was made of the nodules in Dr. Massey's case. He preferred the knife and not the cautery in removing carcinomata. Unlike sarcoma, they seem to be conveyed by the lymphatics. Beard, of New York, in his book published in 1878, advised the use of the galvano-cautery in cancer, and some years since reported 600 carcinomata treated by galvano-cautery, with the death of one case and but a very

small percentage of return. Carcinoma of the breast is apt to recur from incomplete operation. Dr. Gross, the younger, twenty-five years ago, taught the complete operation. If the nipple is cancerous, remove the breast and the general chain of axillary lymphatics. The result of such extirpation is that while carcinoma used to return in from eighteen months to two years, there now are only twenty-five per cent. recurrent under five years, fifty per cent. recurrent in five to fifteen years, and twenty-five per cent. not recurring after fifteen years. Halstead, of Baltimore, goes further, he follows up the line of lymphatics back of the ear. Failure occurs with the knife when it does not go far enough. The advantage of Dr. Massey's method is that it sets up an inflammatory action around the base and squeezes out of existence any small nodules which are not reached by the cautery. The same thing is achieved by thorough extirpation, particularly in carcinoma of the uterus and breast. Many carcinomatous uteri taken at the beginning and amputated high up have been completely cured. To remove cancer, whether with the knife or the cautery, one must go far enough to get into sound tissue. If the nodules are excised and there is good approximation, there will be good union with a quick recovery in place of the open and slow healing ulcer of the electro-mercuric method, and there will probably be no recurrence.

DR. MASSEY replied that the nodules were not examined because they were necessarily destroyed by the method. They were in the line of the lymphatic vessels, clinically showing a perfect picture of recurrence, not due to the knife but to infection antedating operation. They could not have been removed by operation without very extensive dissection. The clinical features of malignant growth are superior to the microscopic features and are often amply sufficient for diagnosis. The slightest sign of a tumor in the breast now entails mutilation of the breast and axilla and leaves an unprotected chest. The electro-cautery method conserves the breast and other organs by destroying only diseased tissue.

DR. L. J. HAMMOND inquired how remote from the point of primary puncture might the coagulation necrosis be expected to take place. It seemed probable that a case requiring extensive dissection could not be benefited by puncture without the likeli-

hood of creating considerable irritation from repeated punctures, a condition very undesirable in malignant growths.

DR. MASSEY replied that the relative suitability of this method and that of the knife must be decided according to circumstances. It is one of the facts of physics that this lethal material can be sent anywhere, and any distance with proper current and time, whether it is the coagulating and destroying material produced by the zinc electrode or the non-coagulating but lethal action of the mercuric electrode. The latter can be sent further, but with less cauterant action than the other. How far and to what degree is a matter of physics that has not yet been determined, and it will require laboratory work to know the rate and progression of mercury per volt per hour. A gross calculation made by Dr. Massey from some experiments, indicates that 5 grains of mercury can be carried by 50 milliamperes 1 centimeter in 10 minutes. Electrodes have been placed in the axilla and by using several they can be disposed for proper progression.

Three cases of cancer of the womb have been treated by Dr. Massey. One case was seen early and might have been removed safely by the galvano-cautery knife, but cure was effected with far less discomfort to the patient by the employment of ordinary 50 to 100 milliamperes currents, three times a week, until ulceration disappeared. The other two cases had been operated on and in one there was a recurrence in the wall of the pelvis. The operative treatment failed utterly, and although the electric treatment seemed to lessen pain and postpone fatal termination, still the patients finally died.

In response to requested information in regard to sloughing and healing after the electric treatment described, Dr. Massey answered that the behavior of tissue varied as zinc or mercury is used. In sarcoma sloughing will come away in from twelve days to two weeks, and the healing and cicatrization may require six weeks or longer. With the gold-mercury treatment very little sloughing occurs in the immediate neighborhood of the electrode, but it comes away in the same time, though the time required for healing is less, being dependent upon the amount of the destruction of tissue.

## SURGICAL TREATMENT OF THE SINUSES ACCESSORY TO THE NOSE

BY L. J. HAMMOND, M.D.

Read May 11, 1898.

THOSE who have given special thought to diseases of the nasal cavities are, I think, ready to admit without argument, that much of the obstinacy that is encountered in the treatment of this region is due, in a great measure, to the disease being located in the cavities or sinuses accessory to this region. It is, therefore, imperative, I take it, that an effort be made to reach these remote sites of lesion, which are such potent factors in the production of a malady that is entirely incurable under any less energetic effort.

Much has been contributed on the subject, as to the study of secretions as a means of determining which of these accessory regions is at fault, and while we are ready to admit that this method may at times enable the observer to locate the sinus involved, it can only be partially beneficial, since in an advanced disease, as exists in so many nasal cavities, there is reason to believe that it is rarely confined to any one in particular. It is, therefore, extremely difficult, if not impossible, to say from the character of the secretion found in a nasal cavity, in which one of the sinuses the greatest amount of disease is to be found. The only method that will secure anything like satisfactory results is a thorough exploration of all the sinuses, and in order that this can be accomplished, a study must be made of their location and the source by which they can be reached.

The accessory sinuses that play so important a part in causing these obstinate conditions are the  
Four ethmoids (2 anterior and 2 posterior),  
Two sphenoids,  
Two frontals,  
Two maxillary.

In point of frequency of involvement, it is, I think, correct to place the anterior ethmoidal as the earliest and most frequently

involved; secondly, the sphenoidal; thirdly, the frontal, and lastly the maxillary.

In placing them in this position in relation to the frequency of their involvement in disease, I am fully aware that criticism may arise, especially in regard to the maxillary sinuses, but the object of this writing is to deal, not with acute inflammatory conditions, but with those chronic suppurating conditions, especially atrophic in character. My experience is, that acute inflammatory changes occur in the last-named sinuses more frequently than in the sphenoidal or frontal.

To prove that the sinus involved cannot with any degree of accuracy be determined, either by the location or the character of the discharge, it is necessary only for us to familiarize ourselves with the intimate relations existing between the anterior ethmoidal, the frontal, and the sphenoidal. If the diseased area be located in the superior region, any one or all of these sinuses may be jointly involved, the frontal through the infundibulum, by way of the anterior ethmoidal cells, the sphenoidal through the superior nasal cavity by means of the opening in the anterior wall of the sphenoidal turbinated bones, sometimes communicating with the nasal cavity through the posterior ethmoidal cells in health and in disease; especially when there is any caries, it may be said invariably to do so.

As these sphenoidal sinuses are seldom present until after the age of puberty, they can usually be excluded as factors in causing a condition of the character under discussion. On the other hand, they not infrequently extend throughout the entire body of the sphenoid, as far back as the basilar portion of the body of the bone.

The posterior ethmoidal sinuses are of very little importance, amounting indeed to little more than cells formed by the union of the sphenoid and the perpendicular plate of the

ethmoid, and while distinctly separated from the anterior ethmoids in health, in an advanced carious condition of the latter, they may invariably be considered involved.

There is one symptom when associated with other evidences of sinus-involvement, that I think may be considered of importance, at least in determining the existence of disease within the anterior ethmoid, namely, interference with the sense of smell, for it will be recalled that the cribriform plate of this bone transmits all the accessory filaments from the olfactory bulbs (?); therefore, partial or complete loss of smell, associated with an obstinate muco-purulent discharge from the superior region, would point strongly to ethmoidal disease, and would justify the belief that these sinuses are certainly involved, and no more. Aside from this one symptom, I have never felt inclined to consider any one sinus involved, without a more rigid examination of the whole.

The ethmoids, as before indicated, are invariably the first attacked; it is not until the pathologic process has thoroughly invaded this region, that the sphenoids become involved. It is plainly seen that the mode of entrance to the sphenoidal sinuses, when not directly through the posterior ethmoidal cells, may escape involvement where the disease is confined to the ethmoids alone, while the frontal sinuses, if the disease be extensive within the ethmoids, invariably, through continuity of structure, become infected. In the majority of cases, however, when the disease is extensive in the ethmoidal region, the pathologic condition does not stop short of invading the sphenoids, and owing to inadequate drainage, there is produced this obstinate disease of the nose so well known to all.

Owing to the position of the frontal sinuses, drainage is much more effectual, and unless pathologic conditions shut off the means of drainage, they are much less likely to prove so obstinate.

So far I have not dwelt upon the maxillary sinuses as factors in causing this obstinate condition of the superior nasal cavities, because I do not believe them such, except in a secondary manner from their location. They are within the maxillary bones and on either side of the nasal cavities, and usually open into the latter about the center of their outer walls, though this is by no means their

constant position. Their entrance is frequently posterior and above, and in a dried specimen in my possession the opening is in the superior region. When the opening is posterior and above, these sinuses are, of course, more likely to be accessories in the atrophic changes under discussion, than when the entrance is in the more usual position, the center of the outer wall: first, because of the difference in the epithelial structure of the anterior nares; second, because of the difference in the position of the mucous glands.

The anterior nares are more often not involved, even when the posterior and superior nares have suffered extensive atrophic changes. These sinuses are more likely to be involved in acute inflammatory conditions, from cold-taking, dentition and in bone-lesions following tertiary syphilis.

To recapitulate therefore, I would say: There are two forms of atrophic change that take place within the mucous membrane of the nasal cavities and their associate sinuses that call for surgical interference: *First*, primary atrophy, the result of a depraved condition of the tissue as seen in strumous diathesis. *Second*, that following hypertrophy. The last named I believe to be less likely to at least primarily involve the accessory sinuses than the first mentioned, and it is therefore more amenable to local treatment if it be early prescribed with reasonable hopes that the invasion of the sinuses may be prevented.

Atrophy, which takes place within the mucous surfaces in the superior region of the nares, extends to

(a) the anterior ethmoidal cells and sinuses;

(b) the sphenoidal;

(c) the frontal;

(d) the maxillary.

The following fairly represents the frequency of involvement as taken from my records in one hundred cases:—

Anterior ethmoids are alone involved in	72 per cent.
Sphenoids with ethmoids	13 " "
Frontals with ethmoids	10 " "
The three combined	5 " "

*Treatment.*—From a large experience in the treatment of this class of cases, and an equally large share of disappointments in the number of cures effected by the routine methods so long and universally prescribed

by rhinologists, I no longer treat these conditions in any other than a surgical manner.

Those who present themselves to me for treatment have all gone far beyond the early stage, and present symptoms of caries, with the nasal cavities filled with fetid desiccated material, which, if only removed, recurs within so short a time that to go no further than mere cleansing, would seem a waste of energy. The treatment, therefore, is, when the case first presents itself, to thoroughly remove the fetid nasal debris. The patient is then placed upon his back and drawn to the edge of the table so that the head can be dropped at an angle of about forty five or fifty degrees. The ethmoids are thoroughly explored by means of the blunt probe, and after the carious area



is located, a notched shaped curet is used to break down and remove all the bare bone and granulation tissue, the cureting being continued until all the diseased tissue has been removed. This is discontinued at frequent intervals in order to wash out, by using the syringe with warm saturated boric acid solution, all the broken-down necrotic tissue that has been removed. The process of cureting is extended as far back as the diseased tissue extends. It is, of course, impossible when the pathologic process is so extensive, to determine when you have passed from the ethmoidal into the sphenoidal region, nor is it requisite that such knowledge be had.

Since I am not content until all the diseased tissue is removed, I have repeatedly removed the entire ethmoidal cell, and extended my cureting far into the sphenoidal region, without anything but the happiest results following.

When the disease is within the frontal sinuses, the method that I have recently employed has been to trephine the sinus, and if there be caries of the duct, to establish

drainage by retrograde method, after cureting away all carious tissue. (*Philadelphia Polyclinic*, Aug. 7, 1897, Vol. VI.)

When the nasal wall of the maxillary bone is diseased, it can be readily dealt with through the nasal cavity, by removing the carious and granulation tissue. If, however, the nasal wall is not involved, especially when it is not involved at its lower portion, then I believe that thorough drainage of this cavity can be secured only by establishing drainage at the most dependent portion of the cavity. It is therefore my practice to enter this sinus above the second bicuspid tooth. In this way the entire cavity can be most effectually drained and easy access made for cleansing. As before stated, however, this sinus is not, in my experience, involved in the general atrophic disease of the nose, unless its entrance into the nasal cavity is posterior and above its more usual position.

The after-treatment of these cases consists in excluding air from the nostrils by closing them with pledgets of sterilized cotton, which are removed and the cavities washed twice in twenty-four hours, for a period of six days. Usually at the expiration of this time, complete recovery may be looked for, and if it is not secured, it is only because the diseased tissue has not been entirely removed. The operation is then repeated.

The dangers that may accrue from such radical treatment are, first, meningitis, a condition, I may add, that has never arisen in my practice; second, inflammation of the middle ear, following occlusion of the nasal cavity during the period of after-treatment, or possibly, sometimes, from excessive douching, both at the time of the operation and the subsequent treatment. This last condition I have had develop three times, never, however, going on to any serious termination.

Nothing short of the entire removal of all diseased tissue within these cavities has ever benefited the class of cases that has come under my observation.



## DISCUSSION.

DR. MUSSON inquired if Dr. Hammond attributed atrophic rhinitis to disease of the accessory sinuses, and if his paper stated that he opened into the sphenoidal sinus through the ethmoidal cells, and not through the anterior wall of the sphenoid. It is her belief that the opening from the antrum is situated higher up than is usually supposed, and that ethmoidal cells frequently open into the antrum. She also wished to know if Dr. Hammond performed Luc's operation for frontal abscess.

DR. JOHN B. TURNER said he had treated two cases of antral disease of nasal origin, he had washed them out repeatedly and with success. As Dr. Hammond had said, the plug could be kept in by operating through the nose. This seemed to be a very effective manner and occasioned but little inconvenience to the patient.

DR. L. J. HAMMOND, in reply to the first question, said the atrophic changes seem to develop posteriorly, certainly much more so than anteriorly, and therefore it is assumed that they are due to alteration in structure of the mucous glands, which must, of course, extend throughout the entire tract. The chisel is far preferable to the trephine because

the deep layer of the frontal sinus is so very thin and might be punctured if the slightest pressure were used. The operation might be described as opening the frontal sinus by chiseling, preceded by exposure of the sinus-region by a longitudinal incision over the bridge of the nose from its root to above the superciliary ridge and by a retraction of the flap. It is hardly possible to differentiate between the sinuses and the cells of the ethmoidal region. The class of cases seen by surgeons are so far advanced that it is impossible to differentiate. The operator should not stop short of thorough cleansing and the removal of all the carious tissue.

In answer to Dr. Turner's question, it is best to avoid opening the maxillary sinus from the nose. Failures following this method of operating are due to the fact that the maxillary sinus is a study in itself and that the center is divided in so many cases by a ridge of bone corresponding to the roof of the mouth, that it may be said to be composed of two distinct sulci, and therefore an opening into it being above the floor of the sinus may drain but partially. By opening anteriorly one can wash out the cavity far more effectually than through the nose.

## DOES A PHYSICIAN'S BOOK-ACCOUNT CONSTITUTE A LEGAL CLAIM?

BY WM. G. PORTER, M.D.

Read May 25, 1888.

LAST winter I was asked to give testimony before the Orphans' Court to assist in proving the claim of a brother practitioner against an estate. The circumstances were briefly these: The physician had been attending a patient who had resided in the same house with him. He was naturally not only her physician but her friend. The services had extended from December, 1895, to June, 1896, and the amount of the claim was \$420. The bill was duly presented, and the lawyer who represented the estate said the physician would have to prove his claim to the satisfaction of the Auditing Judge. When the case came up it was asserted by the attorney for the estate that many of the visits were social and not professional, and that there was no means of distinguishing between the social and professional visits. The physician had kept an ordinary visiting list, from which he had transferred his accounts to an ordinary physician's ledger. The Judge refused to allow the attending physician to go on the stand and swear as to the truthfulness of his account, but ruled that the bill must be proved by the evidence of a third party, or the production on his part of what he called a book of original entry—that is, a book in which each visit is entered with the amount charged therefor, so much for a day visit, so much for a night visit, so much for a vaccination, so much for a confinement, etc. As under this ruling neither the visiting list nor ledger are considered books of original entry, my friend was in great jeopardy of losing his entire claim. Just at this time the attorney for the estate said that they were willing to compromise the claim for \$300. Now this was certainly a very disagreeable position for a conscientious physician, to be accused in open court of having charged

for visits which were not made and for services which had not been rendered.

My friend asked my advice as to whether he should accept the offer, or not. Several members of the Bar, who were surrounding us, advised him by all means to accept a compromise, since, if the matter was left to the decision of the Court, he might not receive anything. And consequently, I advised him to settle. But I did so with some qualms of conscience, because having presented a bill for \$420, which had been contested on the ground that the alleged number of visits had not been made, the acceptance of a less sum might seem a tacit acknowledgment on his part that he had overcharged the decedent's estate, or that he had charged for visits for which he was not entitled to charge. On the other hand, the bill was a perfectly fair and just one, and should have been paid in full, and without question. If my friend had been a millionaire, to whom the difference between \$300 and \$420 was a matter of no consequence, he could have afforded to have refused to compromise; to take the ground that his bill was a just and conscientious one, and that he would never admit that he had charged one cent more than his just due. But there are, unfortunately, very few of our noble profession to whom \$300 are not more than nothing.

Within a few days the same Judge, in the same Court, if he is correctly reported, rejected the claim of another physician for professional services to a decedent, from May 2, 1888, to November, 1893—596 visits, at \$1.50 each, \$894. "All of this claim, prior in date to May 11, 1893, was barred by the statute. How many visits were paid between May 11, 1893, and November 27, 1893, was not shown. The physician's books

were produced, but they were not books of original entry, in any technical sense, and were clearly inadmissible." And thus, after five years and a half of faithful service, the physician received his reward—"nothing"—and this is law, if it is not equity.

As a result of the original case, I felt it to be my duty, as a member of this Society, to call the attention of the Directors of this So-

ciety to the subject, and the present meeting is the result. I feel satisfied that no more important subject could possibly be brought to your attention. "The laborer is certainly worthy of his hire," and if by faulty book-keeping we are deprived of our reward, the sooner the profession understands it the better.

### DISCUSSION.

MR. CUSTIS pointed out that it was quite in accordance with propriety for Dr. Porter's medical friend to accept the compromise, and he thought such would be the opinion of any number of members of the Bar. The acceptance was not an acknowledgment that an unjust claim had been made, but was merely a submission to the strong intimation from the Court that proof of the

service rendered was lacking. Settlements of such cases not only by doctors but also by merchants are made week after week in court and in the offices of counsel because of some defect in the legal proof of the claim. The courts, in settling decedents' estates, require very much clearer proof and more to the point than in cases against living people.

## NOTES ON BOOKS OF ORIGINAL ENTRIES, WITH SPECIAL REFERENCE TO USE OF PHYSICIANS.

BY ALFRED FRANK CUSTIS.

Read May 25, 1898.

THE subject which, at the request of your Committee, will be briefly considered is important to everyone who does work for or delivers material to another to be paid for by the latter at some future time. If all such affairs could be fully settled when they take place, every party to them would be kept from trouble, expense and anxiety, and save time for pleasanter duties. This method, although desirable, is not practicable under our present mode of life. We shall, therefore, go on in the old way and keep up the relations of debtor and creditor. As no one can carry in mind the details of many business dealings, a better means of remembering must be sought in a system of accounts made by writing the different items of such matters in a formal manner in books. It is needful in doing this to keep well within rules which time and use have formed with legal approval to aid in making correct records of business acts, not only that the creditor may have for instant use a clear knowledge of his own standing and at proper times inform his debtor of the facts, but also that he or those who must act for him may be able in the event of law-suits or of the death of himself or of his debtor to show truly his claims against another. The present task is, then, to glance at the theory of some of these rules, and, if possible, give an example of a correct method of keeping accounts with special regard to the needs of the medical profession. If the end sought shall be gained, much, it is to be hoped, will have been done towards bringing about better understandings of personal rights, especially in courts of law, and making lighter the duties of judges and lawyers to the direct profit of all.

It might be interesting to a lawyer, but

would be tedious to the general layman to trace carefully the growth of the law of evidence and see how by easy steps its strictness has been lessened to allow the use of new means of proving disputed facts. The speaker, addressing at this time gentlemen of the medical profession, will, therefore, hold himself to a brief statement of a few legal principles which fit the present subject and of some of the cases upholding them.

The laws of evidence did not until recently allow parties interested in the outcome of a suit in law or equity to testify in their own behalf. These laws called for proof by those who would not profit in any way by the result of the suit or by the statements of parties against their own interests. It has also long been a rule of law that a person legally competent to testify may refresh his memory of past events by reading a writing which the witness had made at the time when the event in question took place or which he can remember having seen before, and, in the latter case can testify that at the time he saw it he knew its contents to be true. Another rule of law admits as evidence the declarations of an agent in cases in which he had authority to make them and bind his principal. There grew out of these principles another by which certain entries made by third persons in books of business people are admitted in evidence. Professor Greenleaf, in treating of this principle in his well-known work on Law of Evidence, (§ § 115, 117) states:

"The party making it" (the entry) "must have had competent knowledge of the fact or it must have been part of his duty to have known it; there must have been no particular motive to enter that transaction falsely, more than any other; and the entry must have been made at or about the time of the transaction recorded. . . . If the party who made the entry is dead, or, being called, has no rec-

ollection of the transaction, but testifies to his uniform practice to make all his entries truly, and at the time of each transaction, and has no doubt of the accuracy of the one in question; the entry, unimpeached, is considered sufficient, as original evidence, and not hearsay, to establish the fact in question."

"The admission of the party's own *shop books*, in proof of the delivery of goods therein charged, the entries having been made by his clerk, stands upon the same principle. . . . The books must have been kept for this purpose; and the entries must have been made contemporaneous with the delivery of the goods, and by the person whose duty it was, for the time being, to make them. In such cases the books are held admissible, as evidence of the delivery of the goods therein charged, where the nature of the subject is such as not to render better evidence attainable."

The first reported case on this principle seems to be *Price vs. The Earl of Torrington*, 1 Smith's Leading Cases, \*390 (1703), which was decided in England by Chief Justice Holt. In this action "for beer sold and delivered, in order to prove the delivery, a book was put in evidence, containing an account of beer delivered by the plaintiff's draymen, and which it was the duty of the draymen to sign daily. The drayman who had signed the account of beer delivered to the defendant being dead, the book was admitted in evidence on proof of his handwriting to prove delivery." This principle was guarded with jealous care against enlargement, as is shown about 1840 in *Brain vs. Preece*, 11 M. & W., 773. The plaintiff's books in the latter case were rejected, although it was shown that "it was the course of business for one of the workmen at a coal mine to give notice of the coal sold to the foreman, who, not being able to write, employed another man to enter the sales and the entries were afterwards read over to him. The workman and the foreman being dead, the entries were held not to be evidence because they were not made by a person having a direct knowledge of the facts or a person employed by him." Lord Abington, at the time, said: "As regards the case of *Price vs. Lord Torrington*, it is better to adhere to that case as it stands and not to give any extension to it."

English respect for the things which are stands out strongly in the last case and is noticeable when one recalls that the Roman law allowed the use of a merchant's book of accounts regularly and fairly kept in the usual manner as presumptive evidence, and that the law in France followed so good a

pattern. The emigrants to America did not bring the same spirit to their new homes. Some of the American Colonies by statute, and others by judicial decisions, soon widened the scope of the principle, and allowed the books of original entries of certain classes to be used as evidence even if kept by the owner himself and he were living.

Justice Gibson gave the reason for this principle and voiced the judicial feeling towards it in Pennsylvania when in 1823, in delivering the decision of the Supreme Court in *Crouse vs. Miller*, 10 S. & R., 154, he said:

"Books of original entries are, at best, a dangerous kind of evidence; they are admissible, on grounds of necessity, not of convenience; and the decisions in their favor have already gone as far as expediency can require, or prudence justify. Such books are barely competent, and although they often afford perfectly satisfactory evidence, yet, being the act of the party using them, and affording extraordinary facilities to the practice of deception, in a way that renders detection difficult, they are entitled to no peculiar protection, but are liable to have their credibility impeached, by every means in the power of the opposite party."

Justice Strong used similar language in 1864 in the opinion in *Hale's Executors vs. Ard's Executors*, 48 Pa., 22. Others have followed in the same line. Justice Mitchell has recently, in *Fulton's Estate*, 178 Pa., 78, (1896), quoted with approval the language of Justice Strong. It should, therefore, be borne in mind that it is important that the rule of law should be known and carefully followed.

Books of original entries are substantially the same as properly kept day books. The parties who may keep them and the manner in which they should be kept have been often and for a long time subjects of consideration in various courts of Pennsylvania. There is no doubt that merchants, shopkeepers, tradesmen, mechanics and farmers in all that pertains to their callings are within the scope of the rule, *Shoemaker vs. Kellogg*, 11 Pa., 310 (1849). Whether this rule takes in persons in professional life, such as lawyers and doctors, is a question which has never been squarely raised and argued in the courts of Pennsylvania.

It was decided in *Hirst vs. Clarke*, 1 Clark, 398 (1842), in the District Court for the County of Philadelphia, that the intellectual labor of authors was not such labor

as could properly be the subject of a charge in a book of original entries. "There was," writes the reporter, "no criterion by which the correctness of the charges could be estimated, the value of the items in such an account depending upon the reputation of the author and it seemed to call for the action of a jury."

Some of the Courts of Common Pleas in Philadelphia have intimated that the services of lawyers are not subjects for books of original entries. The alleged entries in the cases decided were, however, open to the objection of being lumping charges. *Atwood vs. Caverly*, 1 W. N. C., 82 (1874), *Rogers vs. Scullins*, 2 W. N. C., 535 (1876), *Meany vs. Kleine*, 3 W. N. C., 474 (1877).

The case of *Hale's Executors vs. Ard's Executors*, 48 Pa., 22 (1864), was an action to recover a sum of money for professional services as attorney and counsellor at law. The question whether the books of an attorney containing charges for professional advice are evidence did not fairly arise, and the case was decided upon other grounds. Justice Strong, however, showed that his own judgment was against the admission of such a book as evidence, saying:

"Were the question squarely before us, we should hesitate before pronouncing them receivable. The nature of such a service is peculiar. A book entry of it must be indefinite. There is no measure by which its value can be ascertained. Unlike physical labor, it is incapable of being gauged by the time it occupies, or by comparing it with other similar service with which a jury is supposed to be acquainted. Nor is it capable of such certainty in description as is essential to an ordinary charge for work done. No one would contend that a charge of a certain sum 'for work' or 'for merchandise,' without specifying the work or the time consumed in doing it, or specifying the articles sold, would be admissible in evidence. It lacks certainty, and the utmost implication of the law, if any would be made, would be of a promise to pay the smallest possible sum. But a charge for advice is equally uncertain, and still more out of the usual course of business. It has been decided that literary labor is not a fit subject for book entries. It is not within the necessity that opened the door for the admission of a party's own books. In what respect does professional advice given by an attorney differ? Without, however, determining this matter finally, we content ourselves by holding that the entries rejected in the court below were not admissible."

The rule as to physicians (note that this word is used thoughtfully and does not include surgeons) seems to be different, although the language of Justice Strong in *Hale's Executors vs. Ard's Executors*, *supra*,

seem to the speaker to suit each class equally well.

The case of *Langolf vs. Pfrommer*, 2 Philada., 17 (1856), was tried in the Old District Court of Philadelphia County before Judge Hare. The verdict was for the defendant. Judge Hare, in disposing of a motion for a new trial and refusing it, filed a written opinion. The opinion shows that a book seeming to be of original entries was admitted in evidence, but does not show that any objection was made on the part of the defendant, or that there was any evidence contradicting these entries or tending to prove that the amount of the charges was unjust. Judge Hare closed his opinion with the following expression:

"No man who examines the account given in the plaintiff's book, of the diseases of his patients and his own remedies, can deny that it justifies doubt or disbelief of his possessing the acquirements necessary for the responsible office which he undertook to fulfil. The jury no doubt thought that whatever the enormous quantity of medicine charged in the plaintiff's bill might have cost the physician, the defendant had paid quite as much as it was worth to the patient, and I certainly do not dissent from their opinion."

A book of original entries, it should be remembered, "is *prima facie* proof of sale and delivery and value of goods delivered. *Ducoign vs. Schreppel*, 1 Yeates, 347 (1784), *Baumgardner vs. Burnham*, 93 Pa., 88 (1880), *Corr vs. Sellers*, 100 Pa., 169 (1882).

The Orphans' Court of Philadelphia County, in the adjudication of estates by its individual members and in opinions of the Court, has decided that books of original entries kept by physicians are admissible under the rule.

In *German's Estate*, 14 W. N. C., 192 (1883), Ashman, Judge, delivered the opinion, and after briefly considering the objection to the books of a lawyer, states:

"But this objection can scarcely be said to apply to the record kept by a physician. It may cover a daily entry of each visit, with the name of each patient, a list of the medicines furnished, and the price which custom has fixed for the particular service. Such a record will comprise all the incidents of certainty of time, person, labor, and value, and each entry will be complete in itself. No more than this is required in the books of an artisan, and the measure of necessity is at least as great in the one instance as the other."

In *Kelley's Estate*, 5 District Report, 262, (1896), President Judge Hanna delivered the opinion of the Court, and after criticis-

ing the lack of care of the claimant, a physician, in keeping his books, used this language:

"The book, if properly and regularly kept, supported by the testimony of the claimant or his clerk who made the entries, will be *prima facie* evidence, and thus far sustain the claim."

In Foreman's Estate, 55 Legal Intelligencer, 148 (1898), the last case reported, Judge Penrose delivering the opinion of the Court said:

"Book entries, it would seem, can only be of such matters as have a general ascertained commercial or business value, as in the case of the price of goods or commodities or the usual wages or charges for day labor or routine services, which, *perhaps*, would include the ordinary visits of a physician, (though see Fulton's Estate, 178 Pa., 78)."

Judge Ferguson has not, as far as the speaker has found, delivered any opinion of the Court, but he has in his adjudications taken the law as expressed by his colleagues.

Fulton's Estate, 178 Pa., 78 (1896), is the latest reported case in the Supreme Court. Justice Mitchell in delivering the opinion of the Court suggestively says regarding a physician's claim:

"How far books of original entry may be received as evidence of services of a professional character has not been settled in this state."

While it is no part of the duty of a lawyer to tell what the law may be at a future day upon any given subject, yet it is safe to say that the Orphans' Court will follow its own rulings in regard to physicians' books until the Supreme Court shall have finally disposed of the question.

The entries must show the items—date, person to be charged, character, quantity and value of the work done. If medicine be furnished, the quantity, character and value of this should be given. If the service be repeated or the medicine renewed or changed during the day, whether once or ten times, a new entry should be made for each time. If the service or medicine be not for the person charged, the entry should show for whom it was given and the liability therefor of the person charged. If there be anything in the service which takes it out of the ordinary character and calls for a special charge, this fact should appear in the entry.

The law does not allow a lumping charge—that is, one which does not give items of time or material whereby the value can be

ascertained and its correctness tested. This principle is well brought out in *Corr vs. Sellers*, 100 Pa., 169 (1882). Sellers brought action against Corr to recover for work done. The book entry was "B. Corr, Dr., July 13, 1880. To repairing brick-machine, \$1,932.76." The court below admitted this, and a verdict was given for plaintiff. The Supreme Court upon writ of error reversed this judgment.

Justice Mercur, delivering the opinion of the Court, said:

"The charges must be reasonably specific and particular. This is the more necessary, inasmuch as when received, the books are *prima facie* evidence, both of the items charged, and the price or value carried out: *Ducoign vs. Schreppel*, 1 Yeates, 347; *Baumgardner vs. Burnham*, 12 Norris, 88. A general charge for work and labor of a mechanic, without any specification but that of time, cannot be supported by evidence of an entry on the book. Therefore, a bricklayer's charge of '190 days' work' was rejected: *Lynch's Adm'rs vs. Petrie*, 1 Nott & McCord, 130. So a charge of '13 dollars for medicine and attendance on one of the general's daughters, in curing the whooping cough,' was rejected as too indefinite: *Hughes vs. Hampton*, 2 Const. Rep. (O. S.), 745. An item in an account of 'seven gold watches, \$308,' was held insufficient: *Bustin vs. Rogers*, 11 Cush., 346.

"It is contended that the entry on the book was admissible to charge the plaintiff in error, under the authority of *Nichols vs. Haynes*, 28 P. F. Smith, 174; and *Feigel vs. Latour*, 1 W. N., 335. It is true the entry on the book was admitted in each of those cases: but not in either as the foundation of the plaintiff's claim; but rather as memoranda to aid or refresh the memory of the witness. In the former case it is expressly held that lumping charges in a book will not stand as evidence. In *Baumgardner vs. Burnham*, 10 W. N., 445, it is again held that lumping charges for labor are not admissible where specially objected thereto. In that case the error was cured by reason of the objection not having been so made.

"In the present case the objection was special and specific. It was to the lumping form of the charge. There was nothing therein to indicate the number of days, weeks or months of labor claimed to have been performed on the machine, nor the price charged for any of them; nothing to show the kind, quantity or value of the materials furnished, nor the price charged therefor. No item is given whereby the value of anything which entered into the repairs can be ascertained, and its correctness be tested. What share or proportion of the aggregate sum charged is for work or what for material, if any, is not stated. A lumping charge of nearly two thousand dollars was thrown into the jury box, and the opposite party, without proof and without information as to the items of which it was composed, required to defend against it.

"We think the learned judge erred in admitting this book entry as evidence to charge the plaintiff

in error with the amount thereof. The error was not cured by the general character of the evidence afterwards given; something more specific is necessary to prove the claim."

The difficulties in the way of the surgeon, and probably the consultant, are shown in this case, in *Hale's Executors vs. Ard's Executors*, *supra*, and in a more practical way in the opinion by Judge Penrose in *Foreman's Estate*, *supra*. The book of entries was not exhibited in the latter case. The claim was based upon an alleged entry therein, as follows: "January 7, 1893, John R. Foreman, Snared off anterior internal polypoid." The part of the opinion bearing upon this is:

"The meaning of this, as we are told, is that a surgical operation was performed by which an 'anterior internal polypoid' was 'Snared off,' or, as we are further informed, removed; but there is nothing to indicate by whom it was 'snared,' unless by John R. Foreman, or from whom, or that the removal took place at the date of the memorandum, or how long a time anterior to that date was covered by the services—if services are indicated; nor is there anything to show the character of the operation (assuming that it was an operation performed by the claimants upon John R. Foreman, the decedent) or of the object 'snared,' or the time required for its accomplishment, and nothing, therefore, by which the value of the services—if an entry left incomplete by the omission of value is ever admissible (*Rogers vs. Old*, 5 S. & R., 404)—could be established or tested by proof *aliunde*. . . . Manifestly a charge for 'building a house,' or 'erecting a fence,' or 'selling a vessel' (*Winsor vs. Dillaway*, 4 Metc., 221), or 'repairing a machine' (*Corr vs. Sellers*, *supra*), could not be proved by book entry: and unless all 'anterior polypoids' are identical in size, character, and 'internal' distance, and require for their removal the same length of time and professional skill, a charge such as that now under consideration is equally indefinite and objectionable.

"Whether, indeed, services of a professional character, such as those rendered by a lawyer or surgeon, can ever be proved by this species of evidence is more than doubtful."

The entries, which are necessarily in writing, may be made with leadpencil. *Hill vs. Scott*, 12 Pa., 168 (1849), *Myers vs. Vanderbilt*, 84 Pa., 510 (1877), *Tomlinson's Estate*, 133 Pa., 246 (1890). But a book of entries manifestly erased and altered in a material point cannot be considered as entitled to go to the jury as a book of original entries, and ought to be rejected by the court unless the plaintiff gives an explanation, which does away with the presumption which must

exist on its face. *Churchman vs. Smith*, 6 Wh., 146 (1840).

In *Smith vs. Lane*, 12 S. & R., 80 (1824), *Tilghman, C. J.*, delivering the opinion of the Court, said:

"It is a great objection to these books that they do not contain a daily entry of the general transactions at the mill."

The books referred to contained an account of the wheat delivered by the defendant at the mill, and of the flour of the decedent delivered to certain wagoners; *but they did not contain account of all the flour delivered to the plaintiff's wagoners.*

The Supreme Court in *Fulton's Estate*, 178 Pa., 78 (1896), reversed the decree of the Orphans' Court of Lancaster County, for the reasons stated in the opinion of Justice Mitchell, as follows:

"... There is an insuperable objection in the present case, that the book is not one of entries in the regular course of business. It is a separate book containing no charges except against the decedent. This is explained to have been at the decedent's request, but the claimant was not a competent witness to prove such request. No precedent has been shown for the admission of such a book, and the analogies are all against it. While the question does not seem to have arisen in this form, yet all the authorities hold that the books must show that they are kept in the regular routine of business. That is one of the greatest safeguards of the reliability of such evidence."

In *Shoemaker vs. Kellogg*, 11 Pa., 310 (1849), it was held, *Bell, Justice*, delivering the opinion of the court:

"They" (books of original entries) "are receivable to show goods sold and put down in the ordinary business pursuit of the party offering them; thus, the rule is broad enough to include merchants, shopkeepers, tradesmen, mechanics and farmers in all that pertains to their callings.

"But it would be dangerous to open the door of admission wider than this. The inclination of the Court is not to extend this kind of evidence beyond its succinct limits, and we think it has not been so far stretched as to include the casual sale of an article, not in the course of the parties' business, and of which it is usual to take other proof of evidence."

This case is quoted with approval in *Stuckslager vs. Neel*, 123 Pa., 53 (1888); *Fulton's Appeal*, 178 Pa., 78 (1896).

In *Walter vs. Bollman*, 8 Watts, 544 (1839), the Court filed the following *per curiam*:

"This paper is not such a book as the law requires. The entries ought to be made in the course of the parties' business, and here the defendant would seem not to have been in business at all, for



he did not seek it. They ought also to be made with an intent to charge, and such an intent is disproved by the defendant's own oath. Besides, the entries were not made regularly as the services were rendered. A day-book ought to be a register of the day's transactions, but cannot be a safe one if they are not registered at the close of the day, or during the succeeding one. Certainly more than one day ought not to intervene, unless there were something very peculiar in the nature of the business. Here there was nothing to require or excuse postponement, and yet two days were sometimes suffered to intervene, and it would be dangerous to give the usual effect to entries thus deferred."

Physicians have had in use for a long time special books made for them by publishers of medical books and stationery. These, when offered as books of original entries, have fallen under the censure of the courts.

In *German's Estate*, *supra*, Judge Penrose in his adjudication said:

"This book contains simply the names of persons in a column on the left page, with tally or tick marks placed opposite in narrower columns—a column for each day of the week—with the names of the month at the top of the page, and another column at the right, headed "Amount" and intended, apparently, for the insertion of the aggregate charge at the end of the week. . . .

"What relation of the persons named is to the owner of the book, or what is intended by the mark is intelligible only with the aid of extrinsic explanation. It is true that a "Table of Signs" at the beginning of the book gives the information that a straight vertical line in the proper column means a "visit made"; a cross a second visit made; a dot and a vertical line a visit to be made, etc., etc.; but whether the visits were in the day or night, at the office of the physician or at the house of the patient, or even that the visits spoken of were the visits of the physician at all, does not appear; and even the year of the visit is not stated. And assuming that the physician's visits are meant, the entry necessarily remains incomplete until at the end of the week the blank for the insertion of the aggregate charge is filled up. In Dr. R.'s book the charge for a visit, either singly or collectively, does not appear at all, though the evidence of Dr. S.

. . . showed what the usual charges among physicians were.

"It is manifest that such a book, the design of which was doubtless for memorandums from which charges could be properly made, lacks the essential feature of a book of original entries, which under the ordinary rules would be competent evidence in support of a claim. It indicates neither charge nor indebtedness and without ancillary proof could not be given in evidence (*Wall vs. Dovey*, 6 Smith, 213), and it is clear that no judgment for want of an affidavit of defence could be taken upon a copy of the entries which it contains. A book of original entries must be self-explanatory and complete. It is only of such a book that a copy of the entries filed in a suit will sustain a judgment for want of an affidavit of defence, and

conversely if the copy is not within the affidavit of defence laws, the book itself cannot be a book of original entries and therefore not competent proof of a claim."

Exceptions to the auditing judge's action in disallowing the claim were filed and argued. Judge Ashman, delivering the opinion of the Court, went over the same ground and ventured to say, "Such a writing would be as unintelligible to an ordinary jury as a Hebrew Bible to a deputy sheriff."

In *Kelley's Estate*, 5 District, 263 (1896), Judge Ashman commented in his adjudication upon a book similar to that offered in *German's Estate* in this manner:

"It is scarcely necessary to add that the entries should be written in some known language, ancient or modern, so that they can at least be translated into the vernacular of the country. The entries in the book of the claimant, however, were of a character which could be understood by nobody but the claimant himself. They consisted chiefly of hieroglyphics which resembled, more than anything else, the signs of the Zodiac in a nautical almanac, and would be even less intelligible than the latter to the ordinary reader. The claimant explained that they were meant to indicate, in proper order, day visits and night visits, consulting visits and visits at which surgical operations were performed, but he admitted that they did not denote the price; that all-important feature of a contract being left an unknown quantity, probably for the reason that no symbol has yet been invented which will adequately express the differing values which physicians attach to their services. The book did not even have the poor aid of a dictionary to explain its terms, which appeared in *German's Estate*, 16 Phila. Rep., 318, and for the reasons advanced in that case it cannot be considered as legitimate proof."

President Judge Hanna, in delivering the opinion of the Court dismissing exceptions, added to the force of the auditing judge's words, by the following suggestive criticism and hints:

"The physician, the claimant, was, through his own want of care and forethought, unable to properly prove his claim for medical attendance and services to the decedent. By reason of the death of the latter, the claimant was incompetent to testify as to matters occurring in the lifetime of his late patient, so far as related to his own claim. This he must be presumed to know, and a due regard for his own interest should lead him to keep a book of original entries, showing a charge for attendance, with the date, the name of the person against whom the charge is made, and the amount of compensation for the services or attendance. If this had been done, the book, if properly and regularly kept, supported by the testimony of the claimant or his clerk who made the entries, will be *prima facie* evidence, and thus far sustain the claim. But,

on the other hand, the physician relied upon what is known as a "visiting list" to prove the number of his visits, and the parol testimony of experts to show their value. Such a book, containing simply a name, accompanied by a succession of hieroglyphics, to be explained and translated only by the person making them, who, as shown, is an incompetent witness, is clearly inadmissible as a book of original entries."

The law of Pennsylvania upon the subject under consideration may, therefore, be stated to be (a) entries showing the items—date, name of person to be charged, character, quantity and value of delivered goods or of work done for such a person (b) made in writing (c) by a person engaged in business (d) or by his authorized agent (e) in his usual and regular account books (f) in the regular course and line of his particular business (g) at or near the time of the transaction referred to (h) with the intent to charge the person named (i) so that they fully explain themselves (j) and on their face appear to create a liability in the person named, are admissible as evidence in a suit between the parties on being verified by the person who made them, or in case of his absence or death, on proof of his handwriting.

A book of original entries, kept according to the formula given above, is legally valuable in at least four ways. In the event of a suit by the person for whom the book has been kept to recover compensation for services or materials, a copy of the book verified by oath to be true and correct, can be filed in the action, and the defendant thereupon put upon his defence. If the defendant shall not, be able to make in writing a legal defence either upon the merits of the case itself or for technical defects in the copy filed, judgment will be speedily entered against him. If he shall be able to make such a defence (and upon a rule for judgment for want of a sufficient affidavit of defence the truthfulness of the affidavit is admitted for argument), then upon the trial of the cause the plaintiff, by proving the book to be his book of original entries in the usual way and offering it in evidence, may rest his case and throw the burden of attacking the truthfulness of the book and disproving some or all of the items in it upon the defendant. Another proof of the value of such a book appears in claims against the estates of decedents. The book being then proved to be the book of original entries of the

claimant either by the owner himself, who may testify to this extent if he has kept it, or by the person who has kept it, or in case of the death or absence of the claimant or of the agent [*Alter vs. Berghaus*, 8 W., 77 (1839), *Bear vs. Trexler*, 3 W. N. C., 214 (1875)], by proof of the handwriting, will be *prima facie* proof, and, as in the trial by jury, throw the burden of disproving the entries upon the other side. The last and a specially great value of such a record is found in the event of the death of the person for whom it was kept. It may then be used on proof of handwriting, as before mentioned, to show the services and amount due therefor against those who may be living or the estates of the dead.

The words of Justice Woodward, in *Funk vs. Ely, et al.*, 45 Pa., 444 (1863), make a fitting close to this part of the subject:

"The only error" (writes Justice Woodward, in the opinion) "we see upon the record is in excluding from the jury all evidence tending to impeach Ely's books, except such as related to the account against Funk. Such a rule of evidence amounts to nothing in its practical application. If a defendant can disprove his particular account, he has no occasion to assail the general character of the plaintiff's books. It is only when he has no other means of meeting a false charge, that he assails the general character of the plaintiff's book, in the same manner in which he would assail the general character of a witness for truth and veracity, whose particular statement he could not controvert. The plaintiff, who swears to his original book of entries, puts his general character for truth and veracity, and the general character of his book for honesty and accuracy, in evidence, and invites attack upon either, or both.

"It is general character which is thus brought into issue, and general character is formed by numerous particulars. When a book of original entries is offered in evidence, supported by the oath of the party, the court examines it to see if it appears, *prima facie*, to be what it purports to be. If there are erasures and interlineations, and false or impossible dates, touching points that are material, or if for any reason it clearly appears not to be a legal book of entries, the court may reject it as incompetent: *Churchman vs. Smith*, 6 Whart., 146; *Curren vs. Crawford*, 4 S. & R., 2. If this does not clearly appear, it is to be submitted to the jury to judge of, and then it is competent for the adverse party to show its general character by pointing to charges and entries affecting other parties, and by calling witnesses to prove such entries false and fraudulent. That this investigation may not run into excessive departure from the issue on trial, the court should limit it to the time, or near the time, covered by the account in suit, and should suffer no more examination of collateral cases than would bear directly on the general character of the book. If a shop-book exhibit, in respect to customers gen-

erally, illegal dates, as on Sunday, or impossible dates, as 31st of June or 30th of February, or altered dates, or earlier dates after those that are later, or any other such condemning features, they are evidence for the jury upon the general character of the book. The jury may form some opinion from such examination, how far it is entitled to weight in the scales which they are holding. Whilst they should make all due allowances for mistakes, for ignorance and unskilfulness in book-keeping, and for peculiarities in the plaintiffs' business, they should insist on the general honesty and accuracy of the book, made in secret by one party against the other, and now offered as a guide to the conscience of the jury."

A ledger and a cash book may, and in fact should, be kept for convenience and accuracy.

This seems to be the place, in concluding, to say a word as to the mode of proof of a claim for services if a proper book of original entries has not been kept. If there should be an agreement between the physician and his patient, this agreement is not the subject of a book of original entries. It must be proved by its produc-

tion if it be in writing and in existence. If it is not in existence, its loss must be satisfactorily accounted for. Proof of the terms of a lost agreement as well as the fact of the loss, and the terms of a verbal agreement must be made in the event of the death of one of the parties either by disinterested witnesses or by those called to testify against their own interests.

If the services rendered by a surgeon or by a consultant be not the subject for a book of original entries, and the legal doubt seems to be against each, then he must on the trial of the cause or in a claim against the estate of a decedent show definitely the service rendered and the usual and proper charges for similar services by men of the reputation and in the professional rank of the claimant himself. The plaintiff himself is, of course, a competent witness if the party liable for the service be living, but if the latter be dead, then, as has been said before, the former cannot testify in the case.

## DISCUSSION.

DR. M. PRICE inquired whether a written agreement or a verbal one attested by some member of the patient's family would make valid a surgeon's claim on an estate.

MR. CUSTIS replied that such proof would be absolutely final if established by disinterested people or those testifying against their own interest.

DR. H. C. WOOD asked if the physician's book is not a book of original entry that is allowed; and secondly, if the physician is not himself allowed to testify before the Orphans' Court, what kind of evidence must be brought to satisfy the Court that a claim is valid.

MR. CUSTIS answered that he had a case to the point in his paper. If a doctor has no book of original entries which upon their face explain themselves, then he must call somebody who can testify as to the number of visits that he made and the service that he rendered, and then he must rely upon his fellow physicians of the same standing in the profession as himself to put a valuation upon that service. This question arose in the Kelly estate. A bill was presented for

\$635, which at the audit the claimant reduced to \$500. The physician had no books that were at all available. He had to go into the enemy's camp and get the family to testify as to the visits he made. In doing this, making this interested party a witness for one purpose he made him a witness for all purposes. He made it clear that there was an agreement between the decedent and the doctor as to the latter's service and also that he was to be paid so much a week up to a certain time. Beyond that time there was no agreement. The Court finally allowed the doctor for seventy visits at night \$2, for four visits to Atlantic City \$20 each, making \$220 on a claim for \$500, and then allowed a consultant \$10 a visit, the same being proved. The entries in the book of the claimant were of a character which could be understood by nobody but the claimant, they consisted chiefly of hieroglyphics or signs which resembled more than anything else the signs of the zodiac. The claimant admitted that they did not show the price.

DR. H. C. WOOD, continuing the discussion, held that the medical profession itself

is very largely in fault about these matters. A medical bill that goes back five years, or half of five years, should be thrown out of court. It suggests that the bill has been held until the patient's death in order to prey upon the estate. The sooner the profession recognize that their bills should be sent out at least every six months, and really should be sent every month, the less difficulty there will be in their collection.

DR. TAYLOR inquired, if accounts were left by deceased physicians, under what con-

ditions could they be collected. The subject is most important to the family of the deceased.

MR. CUSTIS answered that if the physician had carefully kept his books and kept them as the law required, the books would prove the deceased physician's claim just as well as he could himself. His handwriting could be proved and that would make the books presumptive evidence of correctness and throw the burden of disproof on the other side.

## EXPERT TESTIMONY.

BY JOHN B. CHAPIN, M.D.

Read May 25, 1898.

If it is considered essential to the interests of public justice, and an important aid to courts, that witnesses be admitted to testify as experts in a case of which they have no personal knowledge as to the facts, but in which they are expected, from their experience or scientific attainments, to be able to interpret the true significance of actions and conditions of persons charged with crime; of persons seeking relief by litigation; of persons concerning whom the question of testamentary capacity arises; or in cases of suspected poisoning; then the problem may arise how can such medical or other witnesses be brought into court so that their unbiased judgment may be obtained, and whether any changes from the present methods are, on the whole, warranted.

The question here proposed has been well worked over, and, when considered in connection with the well-recognized infirmities and weaknesses of human judgment relating to this subject, from whatever causes they may arise, it is not a novel one. Expert testimony is frequently referred to as confusing, unreliable for various reasons, illustrating often the theorizations of scientific men rather than the judicial results of science. There are, it must be conceded, some valid reasons for depreciating the value of expert testimony. Two or more experts, who qualify as such, may express an opinion which is arithmetically balanced by equally positive counter-statements, leaving sad impressions and a bad commentary upon the uncertainties of science. A New York State judge, as for himself, was equal to the dilemma in which he found himself entangled, when he stated to the jury on a certain occasion that "medical men are useful in their way; we call them to cure us when we are sick, and to minister to our pains and aches, but when they introduce

their theories and science into a court-room, gentlemen of the jury, you must exercise your common sense. They were far better employed if at home attending to their patients."

Among the hindrances to the formation of an opinion in insanity cases may be named the commonly experienced difficulty in obtaining a complete medical history of a case. Interested parties, from selfish or other purposes, whether their interests and sympathies are on one side, or on the other, may withhold or misrepresent to a degree to influence or mislead the judgment of the physician. A convict undergoing punishment in prison, or a criminal lying in jail charged with the commission of a crime awaiting trial, attracts the attention of the officers by his strange conduct; or perhaps his friends or his counsel, who is to defend him, concludes that the insanity plea affords the best prospect of either mitigating the punishment, or of a verdict of acquittal.

The habitual criminal, in all of his varied experiences in prisons, jails, and, perhaps, during a brief residence in some asylum for the insane, has had abundant opportunities of observing some of the actions of the insane. If he is in prison he *may* become insane, not so frequently from the prison life as is commonly supposed, as from the enforced restriction of his liberty and the irksomeness of his confinement, and because he possesses usually an unstable mental organization. He is also well aware of a law against the confinement of insane persons in prisons, and if he can successfully simulate insanity, he may be transferred to a hospital for the insane, where his life is comparatively comfortable, and where he is quite certain to find some opportunity to escape. In the case of the criminal and the convict, there are the strongest incentives to simulate a

condition which means liberty or life, and if the question of testamentary capacity is an issue, there is the chance of a distribution of an estate different from what the testator may have indicated. In the last case, the trial of the validity of a will or some legal instrument occurs after death and the physician-expert cannot, by a personal interview, obtain any knowledge of the mental condition of the testator. That must come through other sources, which may be clouded from many causes, so that the witness is expected in the last case to express opinions formed mainly on hypothetical conditions. It is all that can be done, as the person is dead and cannot be examined, so that there may be here honest differences of opinion, according to the weight attached to the elements of the hypothetical question.

In a case of suspected or feigned insanity, a physician called to examine a prisoner may observe him doing many things such as may be seen in those who are unquestionably insane, and conclude from what he alone *sees* that the person under examination is insane. Knowing the resources of these frauds and feigners, and the high stake for which they play, it will probably happen that some mistakes will occur if the conclusion is reached in the absence of any case-history to strengthen it, and on appearances alone. It is true that there may have been no material for a case-history, but a negative history would be better and more helpful than none at all. The writer, having visited nine jails, prisons and penitentiaries to examine cases, and some of these on several occasions, has, with a single exception, never been furnished with a case-history of a suspected person, although he has always asked for it. This has usually proved a serious hindrance, and if it is a general experience, suggests the importance of providing by some regulation or law that the medical officers of such institutions be required to examine and make a record on every admission of any facts to be noted bearing upon the mental state of the prisoner, as well as evidences of degeneration which might have an important bearing upon the medical consideration of the prisoner, and become also a valuable contribution to the study of criminology.

If, however, the physician is summoned to examine a convict, or a criminal, who up to a certain date, or until the commission of a crime

has shown no abnormal mental symptoms—indeed, when as to the latter case nothing has occurred in his history except the crime itself to attract attention, after which the prisoner is reported as suddenly manifesting a sullen or stuporous state—refuses to talk or eat; or, assuming a more active and demonstrative state, is violent, tearing his clothing, howling in the night, throwing his bedding out of the cell, perhaps making rhythmical motions, smearing his room, and doing many things that insane people do in some forms or stages of the disease, how shall the examiner proceed with one who will not talk, who resists examination and every interference and advance that is made? If the physician is content to reach a conclusion that the man must be insane from what he has seen in a brief examination, it may and probably will turn out that a mistake has been made. But there need be no haste in reaching a conclusion in these cases, and one of the first steps would seem to be the complete isolation of the prisoner, and the prevention of all communication with persons who would constitute an audience, except those who have official relations with him—in other words, he should be left absolutely alone. The physician having learned so much of the prisoner's case that up to a certain date—hour, even, or a night—or until the commission of a crime, that he was considered in his normal state, when, without prodromal or premonitory symptoms the sudden change took place, and the extreme manifestations showed themselves, he must then recall what his experience, observation, and his reading also, have taught him. Excluding what he has seen for the moment, the medical observer must remember the fact that there is an order of progress in insanity, as in other diseases, and that this disease does not manifest itself suddenly or instantaneously. He must take counsel of his experience, which has taught him that dementia is the terminal stage, and not the initial stage—that the appearances which belong to chronic mental degeneration do not usher in an attack of insanity. He must wait and expect that time will furnish a solution of any doubts, if they exist anywhere, although the examiner, guided by the rules of his experience, has no doubt in his own mind of the correctness of his judgment. It would be unfortunate for anyone to assume that his judgment is infallible,

and that he can make no mistake. It must be admitted to be within the range of a possibility that anyone, however skilled, may make an erroneous judgment, yet while it is the common experience for all feigners to commence with some extreme manifestation of insanity, as complete dementia, or some simulated manifestations of an acute mania with a demonstration of motor disturbance and noise, it may usually be correctly concluded that if there are no incipient symptoms and no prodromal stage, which have existed for weeks and perhaps months, the person is not insane. It must also be remembered that no two cases of insanity are precisely alike, so complex is the organization of the human mind, and as was observed by Dr. Savage, "no two houses ever fell to pieces exactly in the same way," yet it may also be said of all ruins that they look very much alike in some respects.

It would be most helpful in all cases of suspected feigning that a case-history, which may prove to be the key to solve the problem, be kept by the resident physician of the prison, which could be produced, if required, and also that an isolation room or observation cell be set apart for the detention and examination of these suspects during such indefinite period as would be found necessary in the absence of a criminal hospital where all such cases could be best observed.

To the practice which prevails in the courts of calling medical witnesses for the commonwealth and the defendant to testify as experts in insanity cases is to be ascribed much of the depreciation of the value of evidence of this character of which we sometimes hear. There may be a suspicion that as each witness is engaged by counsel and supposed to receive a fee, that there may be a possible bias arising from this fact. In fact, it might be alleged that under the circumstances absolute freedom from bias was impossible. These witnesses seem to line up on opposite sides, and to express exactly opposite opinions. As to the line of defence which a defendant's counsel will take, and what witnesses he will call to sustain it, the court will not probably interfere. Indeed, a defendant is entitled to any proper defence he can make. Physicians and others have different views of what constitutes insanity, and are sincere in their convictions. One believes in the existence of sudden, momentary, emotional, transitory insanity; and, as

I heard an expert testify, that a person who discharged a revolver five times, as quickly as the trigger could be pulled, had time enough between the second and the third shots to have an epileptic seizure and be irresponsible, and at the third shot recover consciousness and be responsible—(and it was the second shot that was supposed to have done the fatal work)—it seemed that, measured in the fractions of a second of time, it was the quickest beginning and ending of a paroxysm of which I had ever heard. Another believes in the existence of moral insanity—that persons have irresistible propensities to kill, steal, commit forgery, commit indecent assaults, and yet be sane as to all their intellectual faculties, and as to their remaining moral faculties, except the faculty involved in the criminal act. There are many questions as well as conditions about which physicians do not agree, and cannot agree, because of theories and speculations about the human mind. When these differences among physicians make their appearance in the course of a trial, they have the obvious effect to lower an estimate of the value of expert testimony, confuse the jury, and disgust the court. It is also asserted by some that all criminals are unsound of mind, insane, or degenerates. Deriving results from external marks, or measurements of a physical character, it is argued that the mental and moral characteristics of the enclosed brain must necessarily be weakened or abnormal, and that the subject is unfit for trial, punishment, or criminal seclusion—forgetful of the fact that human society must mercifully organize for its own protection. Then again, there have been members of our own profession who as experts have considered it proper to state all that could be presented that was favorable to the party employing them, and to withhold what might be otherwise. I have known of one instance where a large retainer was paid an expert, with the understanding that he would not be called, nor consent to testify favorably to the opposite side, it being the real purpose he should not appear. There are also personal antagonisms and elements, jealousies, fixed ideas about capital punishment, theories, etc., which utterly unfit some to exercise the functions of an expert witness in a judicial manner. Much of the fallen state of expert testimony is owing to the disposition of the courts to throw down all bars

and permit the largest liberty in the introduction of expert testimony of this kind in capital cases. One of the outcomes, to be expected of the admission of quasi expert testimony, has been the acquittal of persons charged with high crimes, who have used the insanity plea as a bridge to land them safe and harmless beyond the jurisdiction of the court, and to throw discredit upon the regularly constituted proceedings of law—a result equally damaging to all interests concerned.

Doubtless, the subject of the enlarged and indiscriminate admission of expert testimony, and, at the same time, the permission given to the expert to express an opinion of the mental condition of the defendant after an examination, which is a relaxation from the rigid rule of another day, have engaged the careful consideration of the judges, and they may conclude the present methods, on the whole, to be the best. The question of insanity is a fact to be found by a jury, and, in the writer's observation, juries have made no greater mistakes than the experts.

Hardly a year passes but some attempt is made in some of the States to cure the alleged evils or abuses of expert testimony and to change existing methods. The plan, as in New York, which contemplates the submission of the question of insanity to a medical commission before trial, received no favor from the judges for good reasons. The practice in this State is to bring the criminal into court and try out both the issue of the crime and the alleged insanity, giving him the opportunity of interposing his defence and calling his witnesses, as a right of which he cannot be deprived, instead of remitting the issue of insanity alone, and at the trial stage, to a commission of medical men who are generally unacquainted with rules of evidence and the legal principles which might be involved in such examinations. Recently in this city the Commonwealth boldly forced the issue of insanity in two cases at the commencement of the trial—in one case as a conservator of the interests of the defendant to prove the existence of insanity at the time of the commission of the homicide, and asking the jury to acquit, which they did; and in another case, without waiting for the defence to interpose a plea of insanity, placed the physician-witnesses on the stand to prove the defendant was sane when the crime was committed.

In England, recently, an actor was assassinated, and when arraigned, the assassin plead guilty, but *non compos mentis*. Within a few days a person, charged with crime in one of our United States courts, entered a plea of a similar kind. In both cases the judges accepted the plea of guilty, and announced they would take steps to ascertain the mental condition. All of these proceedings are strictly legal, but out of the ordinary course of procedure, and very interesting.

Among the schemes intended to elevate the standard of expert testimony, usually originating among physicians or in medical societies, may be named the creation of a board of State experts, or experts for judicial districts, which would embrace physicians, chemists, veterinarians, and a larger number of those devoted to specialties. Perhaps they might be appointed by the judges, or by the Governor, as other commissions and boards of examiners are selected. This proposition is in line with others such as have found favor (though not yet adopted) in the neighboring State of New York and other States, to create commissions to examine persons that they might be licensed as undertakers, barbers, horseshoers, etc. It is a plan to do many things for the community by commissions, at the same time a scheme to create a class of professional office-holders. Knowing enough of the tendencies of American politicians, we shall find sooner or later that the "machine" of politics has discovered new ways of extending its baneful ramifications and powers. The present boards of State examiners are yet on trial, and it is still a question whether their operations have contributed to the public welfare. Until this is shown, it would be better to wait before new boards are created.

Can the medical expert be compelled to attend a trial and give testimony without compensation? This question has been raised. The only way it can be settled would be for some one to decline to serve, and then learn the law in the case from a judicial decision. In the interests of public justice, although not competent to express a legal opinion, I would assume that any citizen may be commanded and willing to appear in court, but it seems a peculiar hardship and an act of injustice to compel a physician to leave his office and his business at a pecuniary sacrifice, and to give of his experience without



a just and adequate compensation. Has the community any right to exact this service even for the public good? If yes, may it not confiscate his property represented in material things under the same plea? For such service the expert should be paid, not an extraordinary fee, but such reasonable compensation as the sitting judge would approve. As a matter of personal experience, I have never had occasion to complain of any injustice in respect to compensation or treatment, and it hardly seems worth the time to discuss a possible happening until it is of such frequency as to amount to an actual abuse.

In 1880, the writer submitted a proposition that he believed might be properly accepted by counsel in a large number of cases where expert testimony is desired and necessary, viz.: that all the counsel concerned, waiving all rights, would each present the names of an agreed number of experts from whom the trial judge would name three and fix their compensation or fee. Although this proposition received the favorable commendation of judges and members of the bar as fair and calculated to secure the independence of the experts, and to remove even the suspicion of a bias, nothing came of it, as it was said it would not receive the assent of counsel in every case, and could not be made binding. Probably, it seemed too complicated.

In a judicial hearing before Judges Bingham, Hagner, and Cox, composing the Supreme Court of the District of Columbia, to inquire into the alleged insanity of a person convicted of double homicide, they created, of their own motion, a commission to sit in the court-room, listen to the evidence, examine the prisoner, also to examine and cross-examine the witnesses, and to make a report on the mental soundness or unsoundness of the prisoner. The judges permitted the

prisoner to have counsel, witnesses, and three experts. The commission presented a report. When the prisoner's counsel presented eighty-four questions to be submitted to the commission, the judges said, on examining the questions, that they were in the nature of a strict cross examination, which they refused to permit. The understanding that a cross-examination upon the reasons leading to the conclusions would not be permitted, was an additional assurance of independence of judgment. A different report would have been rendered undoubtedly, if the commission had prepared one and then expected to be subjected to a rigid cross-questioning as to their reasons. The judges expressed the opinion that the whole proceeding had been very helpful to them. The compensation was fixed by the Department of Justice.

It has been the purpose of this paper to point out some of the hindrances in the examination of a certain class of insanity cases, and emphasize some of the principles that might aid the examiner. Notice has been taken of some of the causes of the depreciation of expert testimony, and that medical men themselves, and their psychological theorizing, have had a share in bringing about this result. Attention has been called to various schemes and plans to remedy the existing practice by legislation, which are all destined to fail, and ought to fail, of their object. When lawyers and doctors are more generally agreed about the nature of insanity and other scientific questions, and the former abandon some of their incongruous hypothetical questions, perhaps the present friction about this subject will disappear, and expert testimony be elevated to a higher and more useful place, and, perhaps, without a trial of experiments. Until that time arrives it may be wiser to adhere to present practice and methods.

## DISCUSSION.

DR. JAMES HENDRIE LLOYD opened the discussion and said: The problem presented by expert testimony in mental and nervous diseases is beyond question more intricate than any that comes before the courts of law. To the physician there should be nothing remarkable about this fact, and in-

stead of deploring what has a very obvious reason for it, he should take more firm ground than he usually does to point out the reasons and to defend himself and his specialty from the criticisms that are too commonly uttered against both by persons who are either unthinking or not sufficiently in-

formed to arrive at a just judgment. It seems to be the understanding of both the courts and the public that a medical expert, when he goes on the stand, should have arrived at his decision in the case with all the certainty that attends the demonstration of a mathematical problem. He is to have no doubts and but little latitude for variations of opinion. As he is called in order to help to establish some momentous fact, upon the determination of which may depend the question of life, liberty, or estate, it seems to be considered that unless he can arrive at a determinative opinion his expert testimony is without value; and in case he is opposed by another expert, who is equally eminent and credible as himself, the conclusion is that one or both of them are either lacking in intellectual honesty or scientific attainment.

In opposition to this somewhat crude view, Dr. Lloyd offered the following propositions:

In the first place, truth is not always a fixed quantity, to be arrived at by a rule of thumb. If it were, there would be no necessity for our judges and juries. Any man could determine it for himself. No one knows this fact better than the magistrates and officials in our courts of law. The whole system of trial by jury is based on this very obvious fact; the whole machinery of the court is fashioned to give to confusing and conflicting testimony that nice balance that shall point unerringly, in the fiction of the law, to the truth. If this is so in the vast majority of cases that come before the courts; if, for instance, the details of a street brawl, a petty larceny, the division of an estate, the settlement of a disputed election, or the granting of a liquor license, all present problems of uncertainty about which even judges and juries cannot always agree; and if, as is so, these problems are naturally regarded in the courts as perplexing, and no especial comment is excited by this fact, and the additional fact that honest witnesses differ in their testimony and distinguished lawyers appear with equal earnestness and positiveness on opposite sides; if all this is so, how much more should it be expected that the intricate problems presented by the diseases of the human body and, above all, of the human mind, should lead to variations of opinion that are strictly within the bounds both of honesty and experience?

In the second place, it is not the province

of an expert witness to decide the case. It is too much the custom to regard him in that light—and, unfortunately, he is too apt in some cases to regard himself in that light. In a trial for murder, in which a defence of insanity is made, his province is nothing more than to make a diagnosis—with the bearings of this diagnosis upon the issue at large he has, or should have, nothing to do. For making this diagnosis he often has less opportunity and less reliable data than a physician may have in the sickroom for diagnosing an ordinary case of pneumonia or croup. His opinion, therefore, should not be demanded from him as a dogmatic statement of fact, but as an indication merely of his belief. It is from ignoring this function, that some expert witnesses degenerate into advocates. Fearful that they shall be regarded as vacillating or ignorant, they become trenchant and intolerant; but I do not hesitate to say that the fault for this is partly in the courts, who allow both counsel and witnesses to have and to make the impression that the whole onus of the case falls on the expert. It should be better understood that a physician on the witness stand can, without detriment to his reputation, decline to follow into all the pitfalls and quagmires of cross-examinations and hypothetical questions.

In the third place, instead of deferring so much to the criticism that expert testimony is valueless because it is uncertain and contradictory, experts may fairly shift this opprobrium by reminding judges and practitioners at the bar that in their own provinces they are equally uncertain. There would be no Supreme Court in this State if there were no lower courts whose decisions it is necessary to correct and control. Some years ago a notorious politician who had killed a man in this city was sent to the Eastern Penitentiary, but was almost immediately released by the Supreme Court, who found grave error in the trial below. This was not a question of insanity, but simply of who fired the pistol. Oscar Hugo Webber, a plain case of delusional lunacy, for whom Dr. Lloyd testified, was found guilty in this city and sentenced to be hung in spite of the clearest evidence of his insanity; but the Supreme Court gave at least one dissenting voice in the person of the eminent jurist who is now Chief Justice of the State—and the Governor was never elected who was willing to take it on

his conscience to hang the condemned man. As for assuming opposite sides and contending against one another for the establishment of the truth, medical experts have the brilliant example of their collaborators at the bar. Carlyle's description of an advocate is so well known that one may forbear to quote it. It is difficult to see, however, wherein the ethics of a physician's position differs from that of a lawyer who takes indiscriminately either side of a case, provided, of course, the attempt is made to establish and not to distort the truth. No two cases of mental disease are just alike, no two persons were ever injured in exactly the same way in a trolley accident, no two lunatics probably ever made the same kind of a will. In most cases something can be said on both sides, and in a case in which something can be said on only one side, either party thinks that that side is his. This latitude for varying opinions was never so strikingly shown as in the case of the assassin Guiteau. Many who advocated his hanging believed he was at least partly insane; leading minds in this country took part for and against him; the criminal himself contended that he was sane, and a large number of his near relatives had been in asylums. Much depended upon the point of view, the definition of responsibility, the heat of popular passion, the expediency of politics and the prejudices of opposing sides. The case was finally decided and disposed of in a way that calls to mind the remark of an unscientific publican: "Call these cranks sane or call them insane, but kill them all like rattlesnakes."

From Dr. Lloyd's standpoint concerning the limitations of human judgment, the intricacies of science and the uncertainties of legal processes, he has never very actively sympathized with those who are casting about for a panacea for these ills. He does not think it probable that a state commission, or a board of experts appointed by the judges, or a consultation of experts agreed upon by opposing counsel, will eliminate the defects. There will remain the same grounds for variations of opinion, the same inalienable right of the prisoner to call his own witnesses. The best that can be hoped for, and it is enough, will be that experts will continue to more and more fully recognize their moral and scientific obligations and to have an eye single to the justice that is founded on truth. Those who ignore this

rule of conduct will inevitably suffer in their reputations and thus weaken their position in court. Hence the evil tends to correct itself. Their services will be cheapened and no longer sought. He thinks that the expert testimony given in this city today is, as a rule, of a high order. This standard can only be maintained by the activity of the medical conscience and by medical training as reflected in such a society as this, and it cannot be achieved by an act of legislature or the decree of a court.

DR. H. C. WOOD said he had done a great deal of medical expert work and had heard much medical expert testimony, and that some of the latter seemed to him beyond even the possibility of ignorance. But when it came to the question of how medical expert testimony is to be improved, he did not see any light in the answer. It cannot be improved by paying attention solely to the position of the expert. He had seen a physician of high position in a well-known Medical School testify in court that the yellow staining of the tissues throughout a man's central organs was due to nitric acid absorbed through the lungs, and that the acid had circulated in the lungs sufficiently to stain the tissues. A single drop of free nitric acid circulating in the blood would be like a lightning stroke, yet the man recovered \$7,000 or \$8,000 for an alleged inhalation of nitric acid. It is Dr. Wood's belief that far more evil is wrought by neglect of medical testimony than by evil medical testimony. He has seen many cases where injustice was done either through absence of medical testimony or by ignoring it even when uncontradicted. Medical testimony does not so often contradict itself as it is alleged. The cause of medical jurisprudence could be very greatly improved, if specialists were not brought into court to give testimony about specialties other than their own, *e.g.*, the surgeon should not testify about nervous diseases. Dr. Wood called to mind a night visit of an eminent surgeon who came to be posted in regard to the nervous diseases on which he was to be examined on the stand the next morning. Improvement can be made on the subject of expert testimony only by the courts regarding it more, and exercising greater care as to whom they will allow to testify. Improvement cannot be made otherwise, because expert testimony is part of the faulty system of

trial by jury. In boyhood there is a belief that the trial by jury has relations with justice, and is for the purpose of justice. A noted jurist declared in the lower hall of the College of Physicians that there was no greater mistake than the thought that the trial by jury had anything to do with justice; or that law had anything to do with justice; that the trial by jury simply represents the old ordeal of battle as a modern method of keeping one man from the throat of another man, and that is about all that it does. Is there any reason in expecting twelve laborers, or men a little above the grade of laborers, under the fire of conflicting interests and of intellectual powers that have brought their possessors to the fore as mental giants, is there any hope that out of the darkness of such ignorance light should flash out on the problems of life, and the dealings of man and man?

In illustration, an instance was related, where an astute counsel told that he had gained the acquittal of a beautiful murderer—by selecting a jury of young men, and asking them in the peroration of his defence if they were willing “to blot out the greatest work of God’s creation for the sake of a miserable speck of arsenic”? And they said “D—d if we’ll blot it out.”

DR. CHARLES W. BURR said he thought all would admit that there are grave evils in the system of expert evidence. These evils are ignorance and dishonesty. There are a few physicians who will tell lies when on the stand, and there are some so ignorant as to be absolutely incompetent. It also is true that other elements beside scientific attainment go to make up a successful expert. A good round voice, a well-built frame and plainness in speaking influence a jury. The expert’s manner often counts more than his matter. How to correct the evils of the present system is hard to say. It is doubtful if any of the things proposed,—commissions appointed by the State, appointed by the Court, etc.,—could destroy a man’s right to call experts on his own side. The courts of Philadelphia as constituted to day would of course appoint honest and skilful men. But it is very possible in the future to have a dishonest judge or officials who would appoint political hangers-on. Juries are not quite so doltish as is sometimes alleged. Their verdicts are for the most part just. It is

doubtful if there is much or any more divergence of opinion among juries as to insanity than there is among physicians. A jury of physicians might easily contain one or two incompetent men. Probably the best thing is to go on with the present system, but let judges be a little more strict in deciding what constitutes an expert.

The hypothetical question that contains a full and truthful statement of the case to which it is to be applied is very rare. Most frequently it is one-sided, untruthful, and asked not with the desire to find out what is the actual condition of the man to whose case it is to be applied, but simply the question of an advocate and one that can be answered, in the way expected, only by a medical advocate, and not by a man who is trying to give information as to the actual condition of the man.

MR. CUSTIS, while admitting the jury system to be imperfect, united with Dr. Burr in asserting that it is the best system that the wisdom of man has been able to find for the solution of disputed questions between man and man. A great portion of the defects in the jury system to-day are due, not to the laborer and to men taken out of the ordinary walks of life, but very largely to the respectable gentlemen who live on Walnut Street and Spruce Street. Taken as a whole, the men who compose the juries for the trial of cases in the County of Philadelphia are about as fairly fitted for the work as would be more highly educated men. If questions between the employer and the employee, the individual and the corporation, are eliminated, it can be said that the juries try to reach a just conclusion, and in the majority of cases reach the equitable conclusion, if not the legal one. If expert testimony is brought into dispute and is not what it ought to be, it is partly due to the expert himself.

Instances were related testifying to the help afforded the Bar by the well-equipped medical expert—and while a tribute was paid to the careful and sincere evidence of the many—it was pointed out that the lapses of the few tended to discredit expert evidence.

DR. J. MADISON TAYLOR suggested that by no means every individual human being is capable of the same amount of intellectual capacity, although enjoying the best of direction and opportunity. Perhaps it would be

as well in the judgment of expert testimony to judge the lawyer and jury and the whole business by the test applied to children in the kindergarten. He referred to the profound variation in the meaning of the same words as understood by different individuals, especially when looked at from different standpoints, as of professional training in the case of lawyers and doctors, and accidental concepts as found in jurymen drawn from widely variant attitudes of life.

A great element of confusion to the medical mind is the antagonistic positions of plaintiff and defendant, for the one or other of whom he must testify, and not from the middle ground to which his education and training fits him. The man of law pleads the cause of one or other with an agility which necessarily confuses the man of healing, and when compelled to follow this diverse unfamiliar course he inevitably exhibits his lack of nimbleness.

MR. DALLAS SANDERS said he thought expert testimony was increasing in importance, and growing in thoroughness in Philadelphia and in the country day by day, just as it has in England. As Dr. Lloyd had described in the latter part of his address, so may it be improved. The best that can be hoped for, and it is enough, is that medical experts will continue to more and more fully recognize their moral and scientific obligations, to have an eye single to justice that is founded on truth. Those who ignore this rule of conduct will inevitably suffer in reputation and thus weaken their position in Court; the evil tends to correct itself, their services will be cheapened and no longer sought. The expert testimony given in Philadelphia is of a high order, it can only be kept so by the activity of the medical conscience and of medical training.

## EXPERT TESTIMONY.

BY DALLAS SANDERS.

Read May 25, 1898.

It is a pleasure for me, being a lawyer, to answer any request of the medical profession, and to endeavor to deliver an address before the County Medical Society, even if I feel I am not fully able to do the subject justice. For I, myself, and I know nearly all the members of my profession, have the most unbounded respect for the learning, the ability and the devotion that physicians show to their profession, often sacrificing themselves and their health to relieve the sick and the suffering.

I know that the courts of this Commonwealth have the same high regard for them, because I remember well a case that was tried in Pittsburg, where a man had gone to one of the free hospitals to be cured of an injury, and who afterwards brought suit against one of the doctors who attended him, alleging that he had not had the proper treatment. This case was tried three times—the first time there was a verdict against the doctor for \$5,512.50; the second time the jury disagreed, and the third time the verdict was for \$12,000, but the trial court reduced this verdict to \$4,000. However, when the case came up to the Supreme Court, that court thought the verdict, even as reduced, was very unfair and unjust, and reversed the lower court entirely, not allowing another trial to take place. The remarks of Justice Green, in delivering the opinion of the Supreme Court, show the court's feeling towards the profession, so I will read a short extract from it:

"It must not be overlooked that the medical and surgical service rendered by the defendant to the plaintiff was entirely gratuitous, the defendant receiving therefor no compensation of any kind. For many years Dr. Williard has been rendering such service to the hospital to which the plaintiff was brought after receiving his injury. He was

one of a corps of physicians, who, from motives of benevolence and charity, contribute as they do in many other cities and towns, their time, their skill, their labor and their most valuable and humane service in relief of the sickness and suffering of their race. If such gentlemen are to be harassed with actions for damages when they do not happen to cure a patient and are to incur the hazard of having their estates swept away from them by the verdicts of irresponsible persons, who caring nothing for law, nothing for evidence, nothing for justice, nothing for the plain teachings of common sense, choose to gratify their prejudices or their passions by plundering their fellow-citizens in the forms of law, it may well be doubted whether our hospitals and other charitable institutions will be able to obtain the gratuitous and valuable service of these unselfish and charitable men.

"It is much more than probable that if this plaintiff had been content to remain at the hospital a week or two longer he would have been cured of his hurt. Because he would not submit to such a reasonable detention he apparently brought upon himself all his subsequent sufferings. If he chooses to take such risks he must take the consequences himself."

But to turn to the subject of which I am to speak to you to-night, I would say that no clearly definite rule is to be found in the books as to what constitutes an expert. According to the "Century Dictionary," an expert-witness is, "in law, a person who, by virtue of special acquired knowledge or experience on a subject presumably not within the knowledge of men generally, may testify in a court of justice to matters of opinion thereon, as distinguished from ordinary witnesses who can in general testify only to facts." Judge Sharswood said in 1869, in

The *Ardesco Oil Company vs. Gilson*, 63 Pa., 146, that a court would not allow the opinion of the witness, not a doctor, as to the effect of an injury to the plaintiff's health to be admitted as evidence. *Water Co. vs. Stewartson*, 96 Pa., 436. It is proper, however, for a physician, after he has described the injuries found on the body of the deceased, to state what in his opinion caused her death and how the injuries were inflicted. *Commonwealth vs. Crossmire*, 156 Pa., 304.

The opinion of a witness who neither knows nor can know more about the subject-matter than the jury, and who must draw his deductions from facts already in the possession of the jury, is not admissible. Were it otherwise, the opinions of the jurors upon the most obvious facts might be always shaped for them by the testimony of so-called experts, and thus would a case be constantly liable to be determined, not by the opinions and judgment of the jury, but by the opinion and judgment of witnesses. *Lineoski vs. Coal Co.*, 157 Pa., 173.

Before a doctor was asked to give his professional opinion as to whether a fractured limb had been skilfully or unskilfully treated, he had testified that he had graduated at a medical college and had subsequently served as surgeon for three years in the army, and that he had examined and treated the plaintiff's injured limb. The court held that he was competent to testify as an expert. *Olmstead & Bailey vs. Gere*, 100 Pa., 127.

A witness called to testify as to the chemical purity of certain whisky stated that his profession was that of an attorney-at-law—he had practised it for forty years, and had never been a practising chemist. It was decided that he was not qualified as an expert. *Haas vs. Marshall*, S. C., May 25, 1888, C. P. of York County.

Witnesses, except experts, who are produced in court and examined, are not allowed to give their opinions or their beliefs. They are merely produced in court to testify as to the facts that have come under their actual knowledge, but an expert can give the jury and the court the benefit of his opinion and of his belief. Therefore, physicians and surgeons when produced to testify in court, not as to an injury that they have seen or at which they were present when it took place, but as to their belief as to the result of that injury, or as to the con-

dition of the party, have higher rights; that is, what you might call higher rights; they stand on a different plane from ordinary witnesses, and it is very important that the medical profession should realize the position that they hold before the court and jury, for their testimony may take away a man's liberty or his life, or his property, or his possessions.

The difficulty that I have seen in expert-testimony of the medical profession is that it is hard to make the jury realize the standing of the men who are testifying and the thoroughness with which some have followed their profession as against others who have not been so careful. In the presentation of a case by doctors as expert witnesses on one side and on the other side, the standing, the ability and the thoroughness of each man should, in some way or other, be shown, so that the jury could realize whose opinion should have the greatest weight. English judges probably present this more clearly and emphatically to the jury than our judges do.

The criticism that I have to make of medical experts is, that they are inclined to testify that a possibility is a probability; that is to say, when a man had been injured, there is a possibility that he may be permanently injured from the accident, or that he may die from it; but the expert, becoming a little overzealous or too much interested in the cause which he has at heart, will state to the jury that a man probably is permanently injured or probably may die from his injuries, when the history of such case will show that he would probably get well, and probably not die, but that there was a possibility of his being permanently injured and a possibility of his death.

According to the Act of 1895 a physician cannot be compelled to testify as an expert.

According to the Act of June 25, 1895, Section IV, no physician is allowed in any civil case to disclose any information which he acquired in attending a patient in a professional capacity and which was necessary to enable him to act in that capacity, which shall tend to blacken the character of the patient, without his consent.

The testimony of an expert is of great importance to the man who is employing him. The technical terms in your profession are much more numerous than in the legal profession and they are very difficult even

to a lawyer, who has paid some little attention to accidents and medical matters, to follow; therefore, it is much harder for a jury to follow these terms and it is of importance that medical expert testimony shall be delivered in careful, plain English, that every man in the jury, whether he is a bricklayer, or whether he is a coachman, or whether he is a merchant, or whether he is a professor in college, may understand it. That has as much weight in the success of a case, in the view the physician gives, as almost anything else. I think the profession realize the growth and the importance of expert medical testimony. The Courts, certainly in this county, have more physicians before them in the last 10 years than they had 25 years ago. The most eminent men in the profession are called frequently, and I have seen them in court and it is a very important branch of your professional work. Probably there is some criticism employed, one or the other differ in their expert opinion as to whether a man is sane or insane, whether injured permanently or not, whether he will die or live from the effect of an accident. It might be better if the Court could pass rules, that there should be a certain number of experts on each side, that their fee should be recovered as part of the costs of the case, and regulate the fee and rule that the number of witnesses should be the same on both sides, except when an accident happens, where the family physician comes in. In this instance the family physician would be presented by himself on one side and then the other side should have a right to call a person opposed to him. I have always found in the trial of accident cases that the family physician generally gives a very fair and truthful statement of the case. The greatest source of difficulty when expert medical testimony is brought into Court, is

to find on one side able men who have one view of the case and on the other side able men who have another view. Even when it holds with our theory of the case, we are sometimes startled by the testimony given by distinguished physicians, who are known as specialists, either alienists or neurologists, for instance, when they tell you a man, who is looking perfectly well, is doomed to live a life of misery or to die. It is very difficult to understand. At the same time I must admit that when I have been on commissions to determine whether a man was sane or not, and from my own conversation with and examination and observation of the man, I, as a layman, could not clearly decide as to the insanity; having confidence in and relying upon my medical associates, I have felt perfectly satisfied that their views on that subject, when they said the man was insane, were correct. They could give me reasons I had not known of why the man we were examining was insane. So, when a jury is treating a question of insanity, they do not see any particular defect in the man's eye or peculiarity in his manner, but still the physician can come forward and tell them and they are convinced. Thus I say the medical profession, in the line of experts, is every day becoming more and more important in their bearing on a man's life and liberty, and upon his retaining his business and his property, and I feel a great interest and am very much gratified at being called to say these few words before the medical profession, for my brother members of the legal profession have the highest regard for the work that you gentlemen are doing.

Years ago the expert testimony of physicians did not have the great weight that it does to-day, so the profession should be profoundly impressed with their grave responsibility as expert witnesses.



## PSEUDO-PUERPERAL CONVULSIONS DUE TO DYSTOCIA.

BY F. SAVARY PEARCE, M.D.

Read June 8, 1898.

B. L. D., aged 17, primipara, a colored rachitic dwarf, was seen with Dr. L. J. Hammond, on February 15, 1898, in puerperal convulsions. The seizures were of obscure origin, since, excepting the noted non-advancing diathesis of the patient, she had advanced to term in the best of health. Careful examination of the urine and of the other emunctories had proved negative as possible etiologic factors in the case. During the previous twelve hours she had suffered gradually increasing expulsive pains. These had become of extreme force, as though her nervo-muscular system was being normally taxed to the utmost. The pelvic outlet was considerably contracted and was irregular in outline; yet it seemed possible that with a normal head-presentation, delivery might be effected by natural means. She was at first attended by a medical student. At the height of her pains, about six hours after beginning labor, a peculiar rigidity of her general muscular system was observed. At this time her mentality was perfect. In a half hour she went into general tonic, then clonic convulsions, losing consciousness last and not profoundly; there was frothing at the mouth. She remained rigid for a minute or so, then the uterine pains seemed to relax, and finally the general rigidity abated and was accompanied by prompt recovery of consciousness. There was no subsequent stupor, as is usual in the epileptic or true eclamptic convulsions.

Veratrum viride had been given in full doses, but without relieving the condition, though it had perceptibly weakened the pulse. When I first saw her the expulsive pains had continued practically unabated up to the twelfth hour, and she had had a series of clonic convulsions similar to the one described. At this stage she was in a weakened, relaxed condition, non-hysterical, and with mind perfectly clear. She had bitten her tongue in one of the unconscious

attacks, and now begged to be relieved of her extreme suffering.

There was but little nausea or vomiting. Her bowels had moved freely up to the time of beginning labor, and upon re-examination of a freely-flowing urine, we found it acid, normal, straw-colored, sp. gr. 1022, and with negative reaction for albumin, or glucose, or indican.

The patient took large quantities of chloroform by inhalation to the full control of a fourth convulsion, which occurred at the acme of renewed labor-pains, a half-hour after we first saw her. This fact, with the unusual order of invasion of an attack of puerperal convulsions, and especially the late occurrence of short-lived unconsciousness, the negative findings in the urinary excretions and other emunctories, the absence of any variation in the temperature curve, and the non-urinous breath confirmed the diagnosis of reflex non-hysterical convulsions. There was absolutely no exaggeration of the subconscious self. The patient was in no wise septic. Renewed pains each time lit up general muscular rigidity, which would go on to convulsion, loss of consciousness, frothing at the mouth, and biting of the tongue. This was proved by withholding the chloroform. Six ounces, taken in about two hours, was the report when I first saw her, so violent had been the reflex excitability.

Dr. Hammond and I concluded that the diagnosis made was correct, and that the insuperable obstacle to delivery was very probably a large child, rather than a contracted pelvis, and not at all *inertia uteri*. To save the woman, after axis-traction forceps availed nothing, it was advised that craniectomy be performed, as the child must already be asphyxiated, and so late in the course of the severe labor, Cesarean section would likely be fatal to both mother and child.

Accordingly, under chloroform narcosis,

I performed this operation, and was kindly assisted by Dr. L. H. Hammond and Dr. Stevans. I made a rapid cranioclasia and an uneventful delivery, with immediate stopping of all uterine spasm and the sequent general muscular rigidity and convulsion; the patient at 2.30 p.m., being perfectly comfortable and rational, presented a picture of exhaustion produced by the explosive muscular contractions so widespread for fifteen hours. There was no rise or fall of temperature before or after the operation. The patient made an uncomplicated recovery. The child weighed 7 pounds.

The patient reported to my office May 23, 1898, in normal health for her, the urine being still negative as it had always been.

This case is reported as one of unusual interest, because of the entirely reflex origin of the what might be well called pseudo-puerperal convulsion. The percentages of death in true puerperal eclampsia being from 30 to 70 per cent., the importance of the recognition of such rare conditions is evident. Time alone would be wasted in other treatment than that adopted in such a case, and venesection, ever so useful in toxic cases, would be a harmful measure here.

The reflex cause removed, there has been no recurrence of convulsive seizures at any time. This is in accord with a previous communication presented to this Society<sup>2</sup> as to true puerperal convulsions seldom leaving an epilepsy behind. Very likely the passing toxicity in the latter, and the entirely reflex cause in our case just reported accounts for this, just as the reflex epilepsies are less common than the essential.<sup>3</sup>

In true eclampsia due to leucomaines, toxins, coli bacilli, metabolites as of the liver, albuminuria, one or all no doubt, it is interesting to note that primipara are more frequent sufferers, and if recovery takes place

<sup>2</sup> Protean Influence of Pregnancy on Idiopathic Epilepsy. *Transactions* for 1896.

<sup>3</sup> A Study in Epilepsy with Dr. Wharton Sinkler. *Pennsylvania Medical Journal*, Sept., '97.

subsequent pregnancies may go on undisturbed, the nervous centers in the brain and cord becoming more immune with advancing years. The limit of 2½ per cent. albumin seems to be an indicator as to the possibility of eclampsia developing in a given nephritic case. Lead-poisoning has been proven to be the inducing factor to true puerperal eclampsia as reported by E. E. Waters in the *British Medical Journal*, 1894, I, p. 682. This could be ruled out of court in the case here recorded. Critical examination of the urine is, of course, essential for elimination of toxic etiology.

Our case, we consider, presents the exact opposite mechanical conditions from an ordinary case of true eclampsia, in which latter the *accouchement forcé* is reflexly set up by the general cerebrospinal convulsion; whereas, in the case reported, the primary spasm took place in the womb at the ninth month, at term, and finally spread to the spinal, then cerebral centers.

In looking over the literature for the past few years no records of such a reflex\* case were found, but many interesting phases of this broad subject can be found in the papers to which the following references point:—

1. Davis, R.: Twenty Years' Experience with Tr. Veratrum Viride in the Treatment of Puerperal Convulsions. *Virginia Medical Monthly*, 1894-95, xxi, 33.

2. Döllerlein: Die Therapie Eklampsie. *München. med. Wochenschr.*, '94, xli, 509.

3. Chambrelent, J.: Toxicité du sérum maternel et fœtal dans un cas d'éclampsie puerpérale. *Arch. clin. de Bordeaux*, '94, iii, 271-283.

\*4. Calaco, B.: Reflex Stricture of the Esophagus in a Primipara aged 16 years, starvation for six months, premature delivery, recovery. *Med. Rep.*, Calcutta, '94, iv, p. 254.

5. Groff, J. W.: Accouchement forcé in a case of Eclampsia gravidarum. *Lehigh Valley Med. Mag.*, vol. vi, pp. 83-87.

6. Riggs, H. C.: Induced Labor as Related to Puerperal Eclampsia. *Medical News*, lxi, 258.

7. Tannier: De l'éclampsie puerpérale. *Progrès Méd.*, Paris, 1894, 73.

## DISCUSSION.

DR. F. SAVARY PEARCE said that he wished to make the point that the convulsions were not hysterical. Besides toxins and leucomaines, there were also many neurotic conditions given as causes of puerperal eclampsia, and no doubt there were many cases of women who have hysterical eclamp-

sia in labor; but he reported this case because it was entirely *unhysterical*. The uterine contractions were of such vigor that they finally overflowed into the general muscular system, causing a convulsion that appeared reflex, and so, in this regard, of similar origin to some reflex epileptic seizures.

## SOME RESULTS OF A YEAR'S EXPERIENCE WITH SUPER-HEATED AIR.

BY A. GRAHAM REED, M.D., of Philadelphia.

Read June 8, 1898.

A YEAR'S experience with the Sprague Hot Air Therapeutic Apparatus has demonstrated that its use is by no means confined to the treatment of what is generally understood by the terms, rheumatism and gout. Its successful application covers a wide range of diseases, particularly of bronchial and asthmatic difficulties, general neurotic conditions, tonsillitis, conjunctivitis, etc., while it is almost a sovereign remedy for sprains or bruises and synovial effusions. Nor has it often been disappointing in its action in the usual types of gout or rheumatism. Even where tophi have formed, the solidifications are frequently softened and carried off through the excretory organs.

The skin and kidneys are stimulated by the hot blood, circulation is restored to the affected part, sleep returns to the sleepless, and the general economy is rejuvenated.

Amongst some 150 or more cases that have presented themselves, there have been some that on first sight seemed to be of obscure origin, but which have been distinctly proven on investigation to be some form of goutiness. Chlorosis, anemia, asthma, diseases of the throat and of the choroid coat of the eye, are often, though not always, the resultants of the lithemic tendency, and they as well as ovarian inflammations have been among the maladies yielding to this form of treatment.

In chest and pelvic diseases the patient is put into the body-machine, an apparatus consisting of a metal or treatment section about thirty inches long, with a closed canvas extension for the feet and a canvas curtain at the free end from which the head protrudes; it being comfortably pillowed, a pleasant sleepiness is frequently experienced by the patient. The heat is diffused over a larger surface of metal than in the leg-machine, and is showered down through a

great number of minute openings on to the patient's body, which is covered by a bathrobe. In this machine, a temperature of 250° or 260° F. seems sufficiently high to obtain desired results. Perspiration is profuse, the lymphatic circulation is stimulated and the joints and ligaments become more flexible.

A Mrs. H. S., aged 63, was a well marked case of chlorosis, the tendency having been inherited from her mother. She was treated in the body machine at a temperature of 240° to 260°. After three or four baths, the chlorotic symptoms gradually declined; the pallor left the face, the shortness of breath and the annoying palpitations disappeared, and the heated blood, pumped through the system, carried health and strength to all parts of the body.

A Mr. J. M. R., 58 years of age, was a case of rheumatic gout, manifesting itself in throat, head, eyes, liver, and knees. After seven hot-air baths the head and eye symptoms disappeared, and after fourteen others, at a temperature from 300° to 336°, the knees became pliant and the man was able to walk twenty-seven squares. Carlsbad and other springs had been tried in vain.

Mrs. S. T., a singer of note, had a gradually increasing inflexibility of the vocal chords, persistent inflammation of the choroid coat of the eye, and stiffness of the ankle-joint. In nine treatments, the flexibility and pure quality of the voice returned and the eyes resumed their normal condition, while the mental depression disappeared with its cause. The deposits in the foot and ankle softened up and full use of the parts was restored.

Age does not seem to be much of a hindrance to recovery; for instance, a Mrs. S., over 80 years old, had rheumatism for the last 25 or 30 years, but was very much worse

during the last twelve months. Extensive tophi had developed in the knees and she had not been down to her meals for five years. After four treatments the "creakiness" disappeared, and on the day of her sixteenth hot-air bath she took a walk of seven squares. She was discharged perfectly well and apparently a much younger woman. An average temperature of  $320^{\circ}$  was employed in her case.

Mr. J. T., a young man of 22 years, suffered from anemia; hands and feet were icy-cold even in summer. The circulatory system was stimulated to healthful action in one treatment and he has since remained normally warm; now a period of six months.

Mrs. A. S. A. has been a sufferer for many years with distressing paroxysms of asthma. From November to May she received nineteen treatments with the result that the attacks are far less frequent and less violent, and there is every prospect of freedom from the trouble by continued perseverance.

Miss L. A. M. was the unfortunate possessor of a gouty ovary; six treatments at a temperature ranging from  $300^{\circ}$  to  $362^{\circ}$  made her apparently as well as ever.

Miss R. M. was a victim of the same trouble, but in greater degree. It was only with the greatest difficulty that she could walk upstairs, the suffering was so intense. She was entirely relieved in eleven applications of the hot air and immediately afterwards assumed a responsible position. She was given a temperature from  $280^{\circ}$  to  $330^{\circ}$  F.

Mrs. R., 60 years of age, was a case of chronic angina pectoris, with atheromatous condition of the arteries and renal insufficiency. Had much pain in the left arm. The heat seemed to lessen the arterial tension and the unpleasant symptoms gradually subsided. In seven treatments she considered herself well, but sufficient time has not yet elapsed to test the permanency of the relief.

Miss C. E., aged 50, had a gouty stomach with inaction of the liver and kidneys, and had suffered from insomnia for years. In three treatments she was so improved as to think it unnecessary to continue, and was well up to the last time heard from.

It is found impossible to prognosticate the number of applications of the super-heated air, as the resilience of the system and its susceptibility to curative influence can sel-

dom be prejudged, but it should scarcely be expected that diseases of many years' standing should be overcome in two or three hours of counteractive effort.

Traumatic gout yields admirably to the hot-air method, and sprains, bruises and the soreness of dislocations, serious bicycle accidents and the like, are quickly overcome by its stimulating properties. Many that came halt and limping and fearful of a long siege of pain and disability, have left the office rejoicing in the full use of the limbs again.

As regards the effect on chest affections, a remarkable case was that of a lady with lobular pneumonia of the right lung. After several days of distressing cough, she was placed, March 20th, in the body machine for an hour. The congested and inflamed lung was immediately relieved, the cough suddenly left, and up to this time, June 1st, has not reappeared. Chronic bronchitis has also been wonderfully responsive to the treatment.

Dr. D. came to the office with an acute attack of pleurisy; was put in the body machine and the temperature carried to  $260^{\circ}$ . In an hour the pulse went from 88 to 100 and the body temperature to  $100.5^{\circ}$ . The difficulty of breathing was relieved in twenty minutes, and the case was entirely cured in one hour. There has been no return.

The blood becomes heated from  $1^{\circ}$  to  $5^{\circ}$  F. and this seems to be the therapeutic factor. The heat stimulates to action the clogged up vessels and congested tissues and incites healthy metabolism. Profuse diaphoresis is promoted without the unpleasant head symptoms usual in a steam bath, as the patient breathes the ordinary air of the room. The dilatation of the bloodvessels and the flow of blood in the skin are greatly increased, and we have every reason to believe that the same hyperemia exists in the sub-cutaneous tissues. After removal from the machine in which the patient is usually kept one hour, another hour or more if necessary is allowed for the drying off, the contraction of the skin, the falling of the temperature to the normal, and to the re-clothing for exposure to the out-door air.

Muscular rheumatism is generally amenable to this mode of treatment, but when stubborn is a cause for perseverance rather than discouragement. Many cases of long standing are now pursuing vocations that

had been resigned from disability. The following are notable instances: Rev. Dr. H., aged 56, had rheumatic fever, which left him some months later with stiffened hands and arms and some functional heart trouble, causing dyspnea at times and inability to exert himself in any way. Had persistent insomnia, nervous depression, dyspepsia, constipation, dryness of the skin and urinary insufficiency, finally culminating in a cyclonic storm of rheumatic fever again. After a few treatments the hands straightened out and the rigid fingers could again hold a pen, to his great delight, for he was a writer of some distinction. At each of his twenty-five baths, extending over a period of about six weeks, there was decided gain, even in the heart symptoms, and the treatment, which he rather feared at first, became a positive luxury. This was ten months ago and he retains his improved condition. In fact all cases, as far as heard from, have kept what they gained, excepting in so far as they have returned to errors of diet and lack of exercise. As a matter of course, the originating causes may induce a return of the trouble. Very frequently when a backslider feels an admonitory symptom, he returns for a prophylactic bath.

A Mr. M. H., aged 51 years, was an intractable case of eczema of three years' standing; the burning and itching were relieved, and the swelling of the skin subsided in three treatments, given three days apart. After six months, there has been no return.

Sciatica of several months' standing, lumbago and torticollis have been cured in one application, but there are forms of rheumatism and goutiness which require many and frequently-repeated treatments, taxing the utmost skill of the physician and the perseverance of the patient. Yet, by repeated and well-directed efforts, the soreness is nearly always relieved, and the pliability of the affected part restored in some degree.

Several cases of rheumatoid arthritis, that king of terrors in the world of lithemic diseases, have been treated with more or less success; more, as regards alleviation of the soreness and general symptoms, but less as regards restoration of mobility to the joints involved. In all instances where persistent effort is made, progress of the disease has been checked, and relief from acute suffering obtained; but the one thing certain about

this disease is, that it cannot be permanently relieved in one or two treatments; there must be a long-continued fight for life, or rather for comfortable existence.

Women are more subject to this affection than men, but the following was a very marked case in the latter sex. A prominent man from a neighboring city had "enjoyed" this particular trouble for over thirty years. It commenced early in life in the thumb of the right hand and steadily progressed until nearly every joint in the body was involved, and the left leg became shorter than the right. He is now 59 years old. He took 53 treatments, ranging over a period of nine weeks, finally considering them not only a curative agency, but a luxury, and he is now more comfortable than for many years. He said he derived more benefit from the hot-air baths than from any of the celebrated springs and baths of Europe or America, and he had been to all of them. Of course, he can never discard his crutches or be rid of the deformities attendant on the disease, but he expresses himself as being more comfortable than for twenty-seven years.

A professor in a Western college was a victim of arthritis deformans, and came for treatment last June. He was obliged to sit with his legs straightened out, and for a year had been unable to feed or dress himself, and could not rise from a chair without help. He was treated in the leg-machine at a temperature varying from 280° to 340°. The diaphoresis was excessive; his temperature would rise from 2° to 4° during the hour, and the hot blood coursing through the swollen limbs, reduced the swelling and relieved the pain. After 12 baths, he was able to feed himself and ride a bicycle six miles. After 25 treatments he was so much improved that he went north to the Adirondacks, where he carried out various exercises prescribed for him, such as chopping and sawing wood, pitching quoits, etc. The improvement continues to the present time.

An elderly lady, a case of rheumatoid arthritis of 20 years' standing, was brought to the office, with feet and hands, legs and arms swollen and twisted. The knees were 22½ inches in circumference, and were reduced one inch at the first treatment. At the end of the third she could close her hand, and, after a few more, she took six steps without her crutches, and shortly afterwards accomplished the feat of going down-stairs forwards

instead of backwards. She became quite comfortable, though the deformities remain.

Showing that this disease is not confined to middle life or old age, is a very marked case of a young woman. In fact its victim is generally attacked in early life. She was fast becoming rigid by the deposits of osteophytes around the ends of the bones of the hands and arms, and to some extent of the knees. She realized the importance of putting forth every effort and for the last five months has been faithful to her numerous appointed hours for treatment and to every item of advice as to diet and general circumspection. The result is that she now does her own work and attends to every detail of her household affairs.

In the course of the 1,400 treatments given during the last twelve months, many exceedingly interesting types of disease have been examined and the great majority have been relieved, the result showing that we have not fathomed all that super-heated dry air is able to do for the ills of humanity. The failure of an apparatus to run to a very high temperature must certainly curtail its usefulness. Not that this mode of treatment is a panacea by any means, but that it is proven to be far-reaching in its direct and correlative tendencies. Acting as well on deep-seated tissues and internal organs as on the periphery of the body, it becomes a most useful adjunct to medical and surgical treatment.

## DISCUSSION.

DR. J. T. RUGH's experience with the use of the hot-air apparatus in rheumatic and gouty conditions had been rather limited, but he had seen much of its influence on ankyloses and on rigid joints of traumatic origin. He has generally observed very good results following applications of hot air for about an hour, the temperature being brought up to 250°, and in some cases to 300°. The structures about the joints are much softened by such treatment, and yield to forced stretching. He has recently corrected the deformity in the majority of a series of cases of flat-foot by baking them thoroughly and applying, under an anesthetic, a screw form of corrector, and thereby forcibly reducing the existing contractions. He thinks hot air has a distinct place in therapeutics, but that it remains to be proven whether its action is widespread or not. In local affections he has found it very effectual, and likens its action to that of heat on glue, the resultant softening permits the restoration of lost motion and function.

DR. ALICE M. SEABROOKE asked Dr. Reed if he combined any other treatment with that of hot air, did he also use massage or any application? Her own liberal experience in the use of this agent almost always had dealt with good results. She had only one case in which there was much inflammation about the joints and in which success did not attend the treatment.

DR. S. SOLIS-COHEN said he had seen something of various forms of affections treated by hot air, both with apparatus like that Dr. Reed refers to and by other means. There is no question that it is to be considered among our useful therapeutic measures and the more one works with it, the more enthusiastic he is likely to be from the results accomplished and the greater is the authority with which he can speak of the range of its application. Therefore when Dr. Cohen said that his own experience would not warrant him entirely in giving the same high view of its varied range of applicability that Dr. Reed holds, the criticism was to be taken with the reserve that Dr. Reed's large experience would warrant him speaking more positively than Dr. Cohen could from his own limited experience. So far as rheumatoid arthritis is concerned, he has become satisfied that in his own hands the treatment is almost useless. He was very glad to know Dr. Reed got better results. He used it carefully in a sufficient number of cases to enable him to give an opinion. It is fair to say that the hot air was applied locally only; he did not use the Turkish bath, or Dr. Reed's modification of the Turkish bath, by means of what he calls the "body instrument." Long-continued treatment, however, conjoined with massage, together with regulation of diet and such medication as seemed to him judi-

cious, gave no result worth the trouble to the patient, physician and nurses, manipulators, etc., concerned. It is true that pain was relieved, and for a while autohypnotic suggestion made the patients believe that they were improving generally, so that if the patient had been discharged after ten or twelve applications, and the patient herself (his cases were all in women) allowed to report as to the result of treatment, that report would have been extremely favorable. But he continued long enough to enable him to form a judgment as to whether pathologic conditions were altered, and he became satisfied that they were not. However, it might be worth while to use this measure for the relief of pain if we cannot relieve it otherwise. In acute rheumatism he has hesitated to apply this method of treatment. One can understand that in certain cases of skin affections of the opposite type it would be very likely to do harm. The application of the method to an early case of pleurisy is certainly quite scientific and rational and one would expect that the profuse diaphoresis and the relaxation of the peripheral vessels generally would tend to the prevention of effusion and the relief of inflammation. In gout the method does seem to have a very distinct and useful field. Whether it is any better than the ordinary sweat-bath by other methods he is not prepared to say, but anything that will stimulate eliminative processes in cases of chronic metabolic failures, such as gout, must be useful.

DR. REED closed the discussion, saying it seemed to him that hot air does more than simply soften the tissues as in glue, by, as it were, melting the crystals and deposits in and around the joint, for it also increases

the circulation throughout the entire body; it puts blood into parts where it had not been circulated; it drives out of the arterial vessels, that have been sluggish, the dead corpuscles and debris; it starts fresh action in the heart; it does many things which physicians yet fail to discover. But to accomplish such results the heat must be applied at a very high temperature, even so high as to increase the body-temperature. The thermometer under the tongue must show this effect. After twenty years' experience in Turkish baths, with the thermometer ranging from 160° to 170°, he never saw the body-temperature rise to any considerable degree; but in the use of a body-machine he that day saw the temperature go up 5° under the tongue in a case of rheumatoid arthritis.

If the joints are stiff they are moved, rubbed, and massaged, also the limbs. Atrophied muscles are frequently met, especially in the leg. In cases of rheumatoid arthritis particularly, there is much atrophy of the muscles of both leg and arm, and when the swelling at the knee or at the elbow has been reduced, there remains weakened muscular tissue which needs kneading and action that the patient may be enabled to walk. In many cases this has doubtless been overlooked in the use of the hot-air method.

Observation of the effect of heat on about thirty cases of rheumatoid arthritis shows its influence to have been most excellent and perhaps as well marked as in any other form of rheumatism. Dr. Cohen's experience dealing only with negative result, Dr. Reed said, is surprising and must be due to fault in the application of a remedy that had given him such wonderful results.

## A CASE OF SYMPHYSIOTOMY.

BY WILLIAM S. NEWCOMET, M.D.

Read June 8, 1898.

IN reporting this case I realize that this operation is no longer as much in favor with the best accoucheurs as it was formerly, and that cases have been reported where, after this operation had been performed, it was still necessary to sacrifice the child to save the life of the mother. Under the circumstances of this case, however, the procedure seemed perfectly justifiable in order to meet the requirements of the occasion.

The patient gave the history of having had a child about 16 months previous to this, her second delivery. During her first pregnancy her physician had induced labor between the eighth and ninth months and this procedure had failed to save the life of the child; and she objected to any interference that would imperil the life of the second.

She was a small woman, only 4½ feet high, of a decided dwarf type, with a large head, a small body and short, thick legs and arms. Her pelvic measurements were as follows:

Iliac spines.....	24	cm.
Iliac crests.....	27	cm.
External conjugate.....	17½	cm.
Internal conjugate, diagonal.....	10	cm.
Internal conjugate, estimated.....	8½	cm.
Right diagonal.....	19	cm.
Left diagonal.....	19	cm.
Between trochanters.....	29	cm.
Circumference of pelvis.....	75	cm.

From these measurements it can be seen that the pelvis was not only contracted but it was also flat. Her husband is a tall, thin man of medium build; his head is not large.

When I was called, labor was well advanced, the membranes had ruptured and the pains were frequent and hard; by abdominal palpation the head could be felt to

be above the pelvic brim, and presenting. Vaginal examination confirmed this and showed that the os was well dilated.

At the same time the disproportion of the head of the child and the pelvis of the mother could readily be made out, but realizing that a large head often comes through a small pelvis, I waited for a couple of hours, and noting no progress at all, applied the forceps, using all the force allowable in such cases, but failed to bring the head down in the least.

Realizing that some obstetrical operation was necessary, and the house not possessing even the ordinary comforts, let alone the conveniences required for a serious operation, I suggested that she be removed to a hospital. This was positively refused, as the patient said she had lost her first child there and that if this one could not be born alive she did not wish to live. Her husband positively refused to interfere.

She was beginning to show some signs of exhaustion, although her condition was still pretty fair. Symphysiotomy was suggested, to which she consented, if it could be done in her house.

The patient was etherized, the parts having been cleaned and shaven; an incision, about 1½ inches long, was made about a half inch above the symphysis, and the tissues were dissected off, both back and front, by the finger. Not possessing Galberti's knife necessitated cutting from before backward. I, therefore, slipped my finger in back of the bone to protect the soft parts from any cutting due to the slipping of the knife. When almost through, the edge of the knife broke, and the separation was completed with a pair of bone-forceps; the wound was packed with iodoform gauze. Forceps were then applied to the fetal head, which was extracted with



but little force; the space between the bones was about 2 inches, and after delivery there was about a half an inch separation, which was brought together with a firm binder.

The child, when born, was asphyxiated, but, due to the energies of Dr. Codman, and the hot and cold water method, the child still lives.

The pulse, when the ether was started, was about 120; after delivery, it dropped to 100.

Immediately after delivery a dram of ergot was given hypodermically, and the placenta expelled by Credé's method; the wound was washed with bichlorid, 1:3000, and was packed with gauze. It was not sewed, for fear of infection and a resulting ostitis, which has been known to occur, with the result of death to the patient. There was consider-

able bleeding from an anterior tear, but it soon stopped without any interference. Her convalescence was rapid under the circumstances, and at the end of five weeks she was walking about, with apparently no discomfort, except a pain in the back, but none whatever over the pelvis.

The only complication was a slight cystitis, which was probably due to catheterization, and some fever, due, no doubt, to the same cause.

The head of the child was somewhat larger than normal, and the fontanels were small. The measurements were: Circumference, 37 cm.; bitemporal, 9½ cm.; occipitofrontal, 13 cm. Otherwise the child was normal.

## DISCUSSION.

DR. STRICKER COLES said that in speaking of the application of the forceps, Dr. Newcomet had not mentioned Walcher's position and the increased antero-posterior diameter it gives. Dr. Coles has delivered the child's head in cases with flat pelvis by employing this position. In Dr. Newcomet's case the head seemed to be a little larger than normal, and in Dr. Coles' cases the heads were about normal. Everything, of course, depends upon the size of the child's head. Pelvic measurement will not amount to much unless the size of the child's head is taken into consideration. With the use of Walcher's position, that is, bringing the woman to the edge of the table with the legs hanging over, and pulling almost directly to the floor, delivery may often be accomplished. Dr. Davis, whom Dr. Coles assisted, used a Galberty's knife in the first few cases, but has discarded it and now uses a curved, probe-pointed bistoury. Where the symphysis is hard a saw is required. He asked how Dr. Newcomet managed to keep the pelvis together, whether he used adhesive plaster or a binder of cloth, and said he was to be especially congratulated upon getting good union. Symphysiotomy entails a lot of work when done in a private house. The main objection to it is the long convalescence and the tremendous amount of work required to keep the patient clean and the

care required in dressing and keeping the bones together and the tissues from coming between the symphysis. The experience of Dr. Coles is limited to cases which he has seen with Dr. Davis. In one of these, five years after the operation, the pelvis was ½ of an inch larger than before operation. Without two good assistants to hold the trochanters, symphysiotomy is to be dreaded, as the anterior wall of the vagina is almost sure to be torn. This tear tends to extend into the symphysiotomy-wound, which renders infection more likely. To prevent this complication, one should have two assistants to support the pelvis, this will also prevent any separation of the sacro-iliac joints. In conclusion, Dr. Newcomet was asked how his patient walked at the present time.

DR. NEWCOMET said, in reply, that when he undertook this operation he was not prepared for it in the least. The obstinate refusal to go to a hospital endangered the woman's life, and he made up his mind that he would take the risk of operating at the patient's home, if she permitted him. The husband at first refused to allow any assistants, but finally permitted one. On the latter's arrival the forceps were applied. The anterior tear occurred, because the woman was unsupported—her legs dangled over the side of the bed. The house was destitute of necessities. There were but two basins, and

they were kept as clean as possible. Following the post-partum cleansing, the woman's hips were bound together by an ordinary binder during the first night. In the morning, in addition to this binder, another of canvas was employed, and it not only enveloped the patient's hips, but also two out-lying sandbags, the idea being derived from the ordinary treatment of fractures of the hip. This canvas binder went from the knees to the chest. Inside the obstetric binder were the usual pads. The dressing of the wound was kept in place by adhesive plaster. In the fourth week of the puer-

perium Dr. Newcomet was taken ill and left his patient in the care of another physician. He was subsequently surprised to learn that she had been walking around, attending to her household duties, from the fifth week of her illness. This is the more astonishing, as she waited on her husband and four men who boarded at the house. She walked to Dr. Newcomet's office recently, and as perfectly as she did before her symphysiotomy. She complained of backache in the beginning of her convalescence, but has not done so of late.

## CURED ORTHOPEDIC CASES.

BY JAS. K. YOUNG, M.D.

Read June 22, 1898.

WHILE it is difficult to know which cases will please a mixed audience of medical practitioners, I have selected a few cases from a large number of cured cases, which have come under my care recently.

### RECOVERY FROM LUMBAR POTT'S ABSCESS.

CASE I.—M. W., white, male, aged 4 years. Family history, negative. Past history, natural birth. At 10 months, croup; at 4 years, brought to University Hospital dispensary, having suffered for 6 weeks with pain in left thigh. During that period he had a limp and was supposed to have had rheumatism. He also had night cries.

He was admitted to the University Hospital February 5, 1894. Examination showed a fluctuating tumor in left groin and above Poupart's ligament.

The case was operated on by Dr. De-Forrest Willard on day of admission. The abscess was opened, the pus evacuated, a counter opening made, and through and through drainage introduced. After the operation a plaster-of-Paris cast was applied. Recovery was uneventful except for the development of an attack of measles.

### RECOVERY FROM LUMBAR POTT'S ABSCESS WITHOUT DEFORMITY.

CASE II.—R. C., male, aged 4 years. Family history: Maternal grandfather died of phthisis. History of present disease: The first symptom was noticed in April, 1893; the child screamed and was rigid at night. A severe chill occurred three weeks later, attended by muscular spasm. Upon examination, marked lordosis was apparent. A Taylor brace was applied and internal medication administered. The case was admitted to the University Hospital July 15, 1894. Patient complained of pain in the sitting posture; the spine was arched and a fluctuating tumor was felt in the left iliac region.

I operated July 20, 1894, under strict antiseptic precautions. The incision was made along the outer third of Poupart's ligament, the pus evacuated, and a counter opening made a little above the sacro-iliac junction. Iodoform dressings were applied.

The sinus healed July 5, 1895.

CASE III.—W. N. M., was referred to me by Dr. Horace G. Wetherill, of Trenton, N. J., now of Denver, Col., August 3, 1894. White, male, aged 4 years, of good family history and well nourished. At the first examination the deformity was seen to be marked, his body was thrown forward and to the right. His right thigh was markedly flexed. He walked with a decided limp and complained of pain in the region of the right hip. The object of the consultation was to determine whether the lesion was in the hip or the spine. The deformity was due to spasm of the psoas muscle, in addition to which there was a marked prominence of the first, second, and third lumbar vertebrae.

Taylor's spine brace was applied, constitutional remedies administered, and all injury guarded against. Recovery was rapid and uneventful, and the result is a perfect cure without any deformity and with perfect flexibility of the spine in every direction. Recovery of this kind is ideal, and is what should be sought for in every case. The brace was removed 2 years ago, and he has remained in perfect health.

### RECOVERY FROM HIP-JOINT DISEASE WITH PERFECT MOTION.

CASE IV.—E. K., white female, aged 9 years. Consulted me with Dr. Jos. P. Tunis, suffering with hip-joint disease of the left side. Family history showed tubercular ostitis of the spine existing in the mother; history otherwise negative.

For some time she was treated in the

Methodist Hospital by head extension and a heavy anterior cardboard splint, after which I applied a Taylor traction splint with crutches.

This case has been reported by Dr. John Ashhurst, Jr., and Dr. Joseph P. Tunis, in the *International Medical Clinics* and illustrates well a recovery from hip-joint disease with perfect motion. At the present time the motion of the hip in every direction is absolutely normal, as illustrated by the 3 fundamental positions of Sayre.

#### RECOVERY FROM HIP-JOINT DISEASE WITH PERFECT MOTION.

CASE V.—J. W., white, male, 3 years of age. Was brought to me by Dr. Frank Woodbury, of this city, suffering with hip-joint disease of the left side.

The characteristic symptoms, spasm, atrophy, limp, and pain were present, and the skiagraph showed the head of the bone to be pushed outward and upward by the effusion. A Polyclinic traction splint, author's pattern, was applied with the use of crutches. The diet was regulated and internal medication was prescribed by the attending physician. Within a year the symptoms subsided and recovery has been complete; the joint being restored to its normal condition.

#### PERFECT RECOVERY FROM HIP INJURY.

CASE VI.—E. H., white, female, aged 10, of healthy parentage, and in good health. Suffering with acute injury of the hip-joint.

This case is one of three of almost identical injury to the hip joint; one of the cases was caused by a fall against a trunk, and another was due to injury from fancy dancing. In these cases there was a limp, and complaint of pain in the hip, but there was neither spasm nor atrophy. The condition was one of acute synovitis of the hip-joint, a condition sometimes followed by tuberculosis of the hip; in fact, the third case was diagnosed as hip-joint disease before it came under my care.

The treatment consisted in recumbency with extension, and the application of large blisters over the trochanter. This was continued for 6 weeks. The treatment in these cases usually taking from 6 weeks to 3 months.

The result is a perfect restoration of function in the part. The slight atrophy of disuse at the close of the treatment was overcome by massage and passive movements.

#### PERFECT RECOVERY FROM CONTRACTURE OF THE KNEE-JOINT.

CASE VII.—M. McC., white, female, aged 8 years; good parentage. Sustained an injury to the knee joint about 3 years ago, which resulted in a marked contraction in the knee and an equinus of the foot. The leg was atrophied and deformed. She walked with a decided limp. The patient was admitted to the hospital May 5, 1897. The measurements at that time were as follows: Right leg, 22½ inches; left leg, 22 inches; circumference of right thigh, 11 inches; circumference of left thigh, 10½ inches; circumference of right calf, 9 inches; circumference of left calf, 8½ inches. Tenotomy of the tendo-Achillis and of the ham-string tendons was performed, the latter by the open method. After union took place, massage and passive movements were employed. The result is a perfect restoration of the joint in function and appearance.

#### PERFECT RECOVERY FROM TUBERCULOSIS OF THE ELBOW JOINT.

CASE VIII.—B. R., white, male, aged 20 years. Family history unknown. Consulted me for tuberculosis of the elbow-joint. There was spasm, atrophy, great swelling, and induration; the limb being flexed to an angle of 150°.

The disease progressed rapidly and excision was considered. Iodoform injections were employed, followed by marked reaction. Fixation, counter-irritation and constitutional remedies were followed by complete recovery, and the joint is absolutely normal in all its functions.

Three operation cases, which I had hoped to show, have left the city. They are:

1. A cured case of ankylosis of the hip. Barker's excision.
2. An excision of the hip by the lateral incision.
3. A case of osteotomy of the hip for ankylosis. Adams' method.

## DISCUSSION.

DR. J. P. MANN, congratulating Dr. Young upon the very excellent results exhibited, expressed his approval of the through and through drainage employed in the cases shown. The best results seen by Dr. Mann have been where abscesses occurred in the course of tuberculous lumbar disease, and where through and through drainage was maintained. He commended the sufficient support enjoyed by Dr. Young's cases for so long a time after operation. The support by plaster-of-Paris bandage or jacket, if watched carefully, is of the best. For cases that cannot be seen frequently, Dr. Mann prefers a steel brace, which surrounds the body at the crest of the ilium, rests upon it, and has crutches extending from the hips to up under the arms—thus supporting the superincumbent weight. He does not like so well a brace that simply supports by up-rights running along the spine. One of the great factors in getting a good result in these cases is thorough immobilization of the part, whether it is the spine or other tuberculous bone. After operation, one should aim at immobilization. It secures quicker and better results. By giving support and by holding the affected parts still, not only can deformity be prevented from

getting worse, but to some extent it may be remedied and reduced. This is shown by some of the cases exhibited, and although in none of them the deformities have entirely disappeared, yet they have been arrested and are less than what they would have been without proper treatment and support.

The hip cases also were very good results. In them, as in other tuberculous joint affections, immobilization with proper support is the thing to be insisted upon, and to be carried out if the best results are to be obtained.

DR. F. SAVARY PEARCE noted the absence of the occurrence of paraplegia in one case. Inasmuch as it was a suppurative case and a lumbar case it was of particular interest to him, as he has observed that suppurative cases are, for some reason, less apt to become paraplegic.

DR. YOUNG explained that immobilization of the joint was accomplished in all these cases by extension. He uses immobilization with extension. There has been a great deal of discussion concerning traction versus immobilization. He uses traction to accomplish immobilization and after operation he always, in some way, applies fixation to hips and spine.

# NEURASTHENIA, ITS CO-RELATION TO THE PHYSIOLOGY AND PATHOLOGY OF THE FEMALE GENERATIVE ORGANS.

[ABSTRACT.]

BY F. SAVARY PEARCE, M.D.,

AND

H. D. BEYEA, M.D.,

Read June 22, 1898.

THE paper dwelt, as indicated in the title, upon neurasthenia alone, and considered the causes of this disorder, predisposing, exciting, and hereditary; it endeavored to explain each: so "that the contrariety of known facts may be in part dispelled, and (as upon the nervous system) perhaps new and better co-relation made of the complex whole." Irritation and exhaustion were pointed out as being the chief exciting causes of all neurasthenias.

Reference was made to the vast literature of the subject of nervous disease in relation to the subject of pelvic disease collected within the past fifteen years, and particularly within the last five years; also to the controversies prevalent as to such relation. It was stated that the discussion had been largely over gross neurologic maladies—the neuroses—such as insanity, hysteria, and epilepsy, and that very little had been said as to those complaints which are more important to the neurologist, and which afflict the greatest number of sufferers, namely, the neurasthenias in women.

It was admitted that the same co-relation, if any, may exist in the male, and especially as to sexual neurasthenia so-called; but, as disorders of the reproductive organs are more frequent, and, as a rule, more serious in the female, the subject was limited to those more exaggerated neurasthenic states occurring in women.

It was pointed out that the various bearings of the subject have been considered by the best men at home and abroad, but un-

connectedly. On the one hand it has been considered by the neurologist without sufficiently definite knowledge of gynecologic disease and its relation to the nervous system. On the other hand, with the rush that has been characteristic of his branch of surgery, the gynecologist, has, in the past, and even up to the present, practised mutilating operations on women and without due consideration of cause and effect. He often looks to his surgical case and at the statistics of operation rather than to the good resulting or to the serious constitutional conditions that may remain as the aftermath.

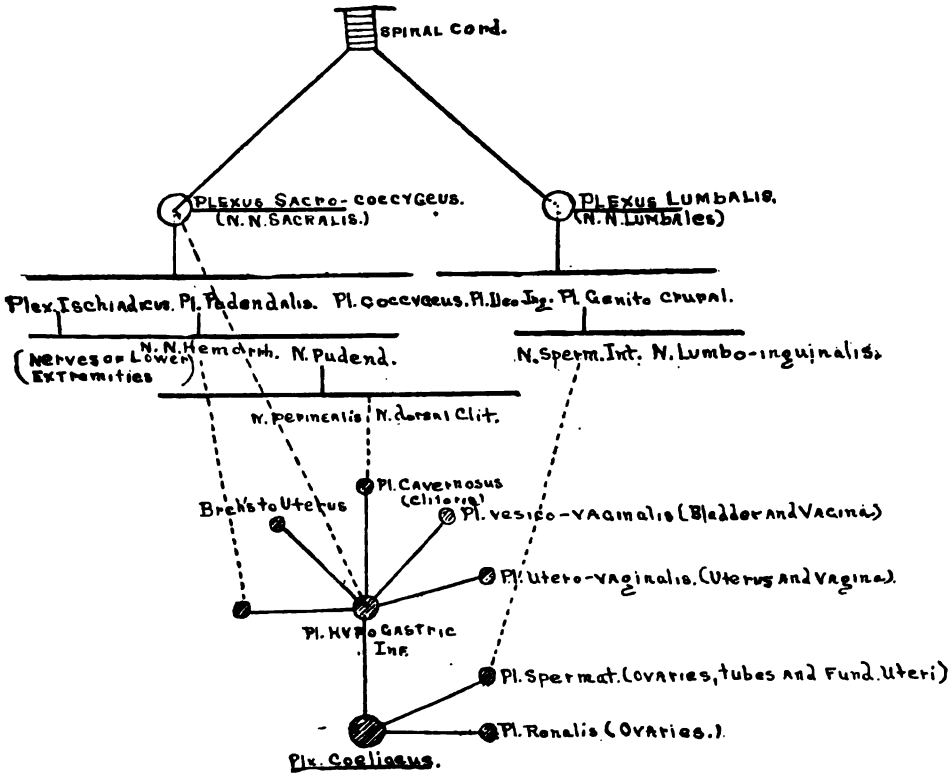
The distinction between essential and symptomatic neurasthenia was held by the writers, also that gynecologic disorders may be capable of modifying the former or of causing the latter, just as the irritation of defective, uncorrected eyes, etc., is known to do. Disturbances of metabolism were also mentioned in connection with cause or effect in each of these two classes of neurasthenia and were cited as studied by one of the authors.<sup>1</sup>

## ANATOMIC RELATION.

For the better understanding of the relation existing between the cerebro-spinal and sympathetic nervous systems and the external and internal genitals, the diagram of Winschied<sup>2</sup> was presented.

<sup>1</sup> The Role of Uric Acid in Certain Types of Neurasthenia and Allied States, etc. *Virginia Medical Semi-Monthly*, June 25, 1897.

<sup>2</sup> From "Neuro-pathologie und Gynäkologie—Eine kritische Zusammenstellung ihrer physiologischen und pathologischen Beziehung," Berlin, 1897.



#### PHYSIOLOGIC RELATION.

The physiologic relations of the female genital organs to the nervous system are particularly and clearly to be noticed at the epochs of (a) normal menstruation; (b) at the menopause; and (c) in sexual excitement. This was amplified in the paper as proof that, if pathologic lesions of either nervous systems or of the female generative organs were existent and causing nervous exhaustion, they may thus produce even more marked and confirmed disturbances, *e. g.*, continued irritation and exhaustion being the cause of neurasthenia's development in most instances, such irritation may reside in the pelvis solely and cause remotely a nervous exhaustion, which may be finally considered by the physician an essential case, when it is in reality a secondary or symptomatic neurasthenia. These difficult border-line cases are to be studied most carefully. This condition was compared to some of the remote and persisting headaches primarily due to eye strain and unrelieved by accurate eye-treatment.

Gross pathologic diseases of the female generative organs were pointed out to be less frequently the cause of exciting a neurasthenia than were finer changes, *e. g.*, fibroid tumors of the uterus seldom have nervous exhaustion resulting. Perhaps in gross lesions in the genital tract, as in cancer of the womb, the nerve paths of conduction of the evident irritation are sooner entirely cut off from the central nervous system than is the case in the finer lesions, or malpositions, as in the instances of lacerated cervix, or perineum, or chronic oophoritis, or retroversion of the womb before the climacteric.

The diseases of the female generative organs most prominent in the production or aggravation of neurasthenia were enumerated.

Retroadisplacement of the uterus, associated or unassociated with disease of the body of the womb, or cervix uteri, or injury to the latter was considered. Such patients complain of sacral backache, parietal and occipital headache, depression, general ner-

vousness, nausea, often palpitation of the heart, and all the symptoms that we could but consider neurasthenic. In laceration of the cervix also, we have in a large number of women similar irritative symptoms (neurasthenic) due to the wound itself, to the discharge, and to the resultant cicatrization pinching the ultimate nerve fibers.

Injuries to the pelvic floor, with or without reparation of the sphincter ani muscle, if sufficiently extensive, may produce pathologic change, not only in the vaginal outlet, but in the internal genitals; and here again, we know that there is continued irritation, and the development of the nervous symptoms described.

Still another class of cases which are rarely seen, but nevertheless very important, are those of sclerocystic degenerative oophoritis, a disease which when *extreme*, as noted in one instance, produced the most marked and persistent neurasthenia. This was cured by removing the diseased ovaries after faithful "rest" treatment had failed. Celibacy here was probably the inducing cause of the disease of the ovaries, and thus of the neurasthenia.

These lesions cited do not represent all that may cause sufficient irritation to exhaust the nervous system; they are, however, those most frequently seen.

A strong point in the relief of these cases, and of the efficacy of gynecologic treatment is the technic of operation. Thus it is of paramount importance to remove all cicatricial tissue in operations upon the cervix uteri if irritation is to be avoided and the patient relieved. Another factor in such a case is the selection of the proper operation (trachelorrhaphy or amputation) for the best results. In the operation of perineorrhaphy, if the pelvic floor is not properly restored we cannot expect relief of symptoms. In the operation of oophorectomy the extensive constriction of large masses of tissue in the ovarian stump may result in tension and in dragging upon nerve-tissue. Hence subsequent pain and discomfort, and the perpetuation of nerve irritation. If judicious technic is followed we conclude that post-operative sequelæ *per se*, said to be so often complained of, will be far less frequent and even very rare.

It was not claimed that the gynecologic diseases heretofore described are always

causative in the development of a neurasthenia. It is known that even those which in a given case may be associated with the most pronounced neurasthenia, may in another instance be found in a woman who has healthy nerves. The removal of the gynecologic causative lesion is not always followed by a cure of the neurasthenia, for the nerve exhaustion may be so far advanced that the patient has become apparently permanently neurasthenic. Again, it must be recognized that in women suffering with associated gynecologic disease and neurasthenia, the primary and exciting cause of the neurasthenia can be independent of the gynecologic disease. In such cases the gynecologic disease may be, and usually is, a factor in keeping up the neurasthenia. Furthermore, symptoms pointing to disease of the female generative organs, without definite pathologic lesions of these parts, were not considered as causes of neurasthenia resident in the pelvis, or as indications for any gynecologic operation or treatment whatever. No matter how strongly a patient's symptoms may point to ovarian or to uterine disease, no operation whatever is indicated unless the disease is definitely demonstrable by pelvic examination.

The treatment of hystero-epilepsy, epilepsy, and the various forms of insanity by the operation of oophorectomy, without demonstrable pathological lesions of the female generative organs, has never been followed by any *permanent* good, and is therefore not justifiable.

It will thus be seen that many cases of neurasthenia, as just considered, are relieved or cured by gynecologic treatment, but this does not imply that nervous treatment should not be used to its fullest extent alone, and in coöperation with gynecologic treatment in the properly selected cases. Thus operation alone may cure a symptomatic neurasthenia of gynecologic etiology, or where the neurasthenia is aggravated by the gynecologic disease; in these cases relief may at once be obtained by gynecologic treatment. In other cases where the nervous exhaustion is still further advanced, approaching chronicity, and, as is usual, if the patient is physically able to withstand operation, it is advisable to first remove the gynecologic cause, and then to institute "rest" or "partial rest" treatment; the more severe cases requiring thorough rest



treatment, and the less pronounced cases modified rest treatment.

There are persisting chronic cases of symptomatic neurasthenia, which, though apparently essential, are really due to or aggravated by gynecologic disease. A woman in this condition is often so feeble when she comes to our hands for relief, that it is advisable to first resort to full "rest" treatment, and all other known measures used in the systematic treatment of bad *essential* cases of neurasthenia. When par-

tial recuperation has thus been brought about, the gynecologic condition should then be relieved by gynecologic treatment.

By these *combined* therapeutic measures in acute and chronic symptomatic neurasthenias, both associated and unassociated with gynecologic disease, relief and cure, in the vast majority of cases, are most apt to be obtained, whereas any single method of treatment will pretty certainly fall far short of cure.

### DISCUSSION.

DR. GEORGE ERETY SHOEMAKER recognized the practical interest of the paper and the general soundness of the conclusions set forth. It is as great an error to overlook the large neurotic element in many cases as it is to overlook the surgical condition, if such be present. In other words, the whole condition must be studied thoroughly. He is not in sympathy with the position that there is absolutely no relationship between neuroses and gynecologic conditions when both are present. This position is sometimes taken by neurologists. When one attempts to study such a case he must, however, be on his guard, not to consider the relation stronger than it is. The gynecologic condition very often introduces a toxic element through chronic suppuration. Long-continued pain from fissure, or loss of sleep from disease of the bladder, for example, or anemia from very prolonged hemorrhage, may affect unfavorably a predisposed nervous system. The comparative rarity of neurasthenic conditions associated with gross pelvic lesions is not invariable. A number of cases could be recalled of gross lesions which presented at the same time marked symptoms associated with the nervous system. For example, he operated a short time ago upon a large dermoid tumor in which the patient had a persistent delusion that she ought not to take nourishment, for the reason that it fed the disease and not herself, so that persistently and for years she had put her finger down her throat, after eating, in order to prevent the feeding of the disease. She had a number of mental peculiarities. He also observed marked hypochondriasis in a tumor case which had bled

for many years. Where there is no persistent drain and no persistent irritation produced by a large tumor it is difficult to see why it should produce any neurasthenia or any nervous derangement. The importance of treatment and of paying attention to both conditions is certainly very great. It is impossible to cure one of these complicated cases without both rest treatment and gynecologic treatment, and it is a great mistake to expect the short rest in bed associated with the operation to do any permanent good. It is quite the fashion for some neurologists to state that what benefit a patient gets when treated gynecologically is due to the rest in bed for two or three weeks following the operation. Surgical experience led the speaker to state that nothing is gained in that three weeks, the loss of blood, purgation, and etherization offsetting the benefits derived from the rest enjoyed. Such patients require rest treatment for several weeks as well as operation, and many must also have forced feeding.

DR. RANDOLPH FARIES asked Dr. Pearce whether he does not attribute the causative factor in the disease to the general condition. In other words, whether Dr. Pearce does not believe that a case presenting symptoms of insanity may be cured by an oophorectomy. He had seen a well-marked case where removal of the ovaries established cure. That is, the diseased condition did not return inside of a year. On the other hand, he has seen a case with similar symptoms where operation achieved no benefit. The two cases contradict each other and leave the causative factor undiscovered.

DR. J. M. FISHER said that the essential

point to the gynecologist is how to distinguish between symptomatic neurasthenia and essential neurasthenia. In a patient suffering from essential neurasthenia, where the neurasthenia is the primary factor, it would be hard to predict whether an operation, say, for reducing coexistent backward displacement of the uterus, would in any way benefit the neurasthenia, because there are many cases of backward displacement which do not give rise to the symptoms. There are more operations done for backward displacement of the uterus than are absolutely necessary. Where there is no associated pelvic disease the fact of displacement should have little importance. So, too, with laceration of the cervix, there are few women who have borne children but have a laceration of the cervix. If a woman is suffering from neurasthenia, how is a gynecologist to say that it is essential neurasthenia or symptomatic neurasthenia? How is the distinction to be made?

DR. A. A. ESHNER recommended that the same distinction in etiology be made as is observed in other diseases. There are predisposing and exciting causes. The predisposing influences are bound up in the individuality of the patient and his susceptibility to a given disease, rather than to disease in general. The exciting causes may be compared to the flame that ignites the gunpowder and causes the explosion. In an individual with the neurasthenic predisposition, a variety of exciting influences may develop the disease. The exciting influence may take the form of gastro-intestinal disorder, ordinary anxieties, eyestrain, overwork, underrest, insufficient feeding, pelvic disease, diseases of the ear, disease of any organ of the body, and it is the conjunction of these two influences that will result in the development of neurasthenia. There are individuals with pelvic disease who do not suffer from neurasthenia; while, on the other hand, there are many cases of neurasthenia in which there is no pelvic disease. This subject has been discussed so thoroughly at the recent meeting of the American Medical Association at Denver that there seems very little indeed to add.

In the treatment one must deal with the causes. The primary indication is to remove immediately the exciting cause, whether this be pelvic or other disease or a vicious mode of life. When there is such a definite

exciting cause, cure will not result unless it is removed. The predisposition is to be corrected so far as possible by nutritive and moral forces. Here the first indication is rest, with forced feeding and a gradual return, on recovery, to the ordinary pursuits of life.

The fact has been cited that observation has shown that in a number of cases in males in whom diseases of the genito urinary tract existed, the proportion of neurasthenics compared closely with the number of neurasthenics in females with pelvic disease. So it seems that it is scarcely just, certainly not wise, to select this single group of causative influences in the development of neurasthenia and give them the prominence that some gynecologists have shown a tendency to do. It must be admitted that in cases of neurasthenia in which pelvic disease exists neurologists cannot hope for cure without removal of the abnormal pelvic conditions and, on the other hand, it would be hopeless to undertake the ultimate cure without attention to the basic condition.

DR. PEARCE in closing the discussion said the gross lesions mentioned by Dr. Shoemaker were only stated by the authors to be much less frequently causative of neurasthenia. It was not said that they did not cause neurasthenia, but that they did so less often. They are less apt to cause neurasthenia for the reason that, as a rule, they produce less irritation. They may produce irritation, but in the author's experience are far less likely to do so.

The point made by Dr. Faries in regard to insanity and hystero-epilepsy upholds the view of the paper that these operations do temporarily relieve the case and the relief afforded may amount to cure, but the question is whether the case remains cured. Of the two cases cited, one was apparently cured, the other was not. In the one apparently cured the question arises whether the sequence was not an instance of effect of operation *per se*, and may not the mental disorder yet return?

This single group of neurasthenic cases being such a very large group, the authors made a careful study of it for the purpose of determining its facts. Disorders of the male generative organization no doubt have a similar influence in causing irritation of the nervous system and in producing weakness and neurasthenia.

### THREE RECENT CASES SHOWING NECESSITY FOR EARLY OPERATION IN INTESTINAL OBSTRUCTION.

BY JOHN B. ROBERTS, M.D.

Read September 14, 1898.

FATAL delay in resorting to operative exploration in cases of supposed intestinal obstruction often comes to the knowledge of surgeons. This paper has been prepared for the purpose of calling attention to the value of prompt exploratory incision into the abdomen; a surgical procedure so free from danger in competent surgical hands as to make very great the responsibility of relative, friend, or doctor, who encourages delay. Even in cases of doubtful diagnosis, the danger of exploration is less than that of waiting.

CASE I.—*Intestinal Obstruction due to Entanglement of the Small Intestine in a Congenital Opening in the Mesentery; Recovery after Celiotomy.*—A young man, aged 19, a patient of Dr. A. Stark, of Philadelphia, was seen on December 4, 1897, with a history of having had no evacuation from the bowels for five days. He had had a somewhat similar attack of obstinate constipation a year previously. He had pain in the abdomen, his temperature was about  $101^{\circ}$ , and his abdomen was distended. The abdomen was opened in the middle line and the small intestine found distended and congested. In the ileo-cecal region the small intestine was acutely bent and entangled in an opening in the mesentery. Without any great difficulty I was able to pull the intestine from the opening, and this allowed the caliber of the gut to be re-established. There was no evidence of gangrene, but the intestine, where it was acutely bent, showed some plastic lymph in the angle of the flexure. There apparently was no actual protrusion of a loop through the opening, but the bent intestine was seemingly thrust into the orifice in such a way that the sharp bend closed the lumen. The intestine was incised at a point

considerably above the seat of obstruction and a large quantity of gas and liquid feces permitted to escape. This opening was sutured in the usual way and the bowel dropped back into the abdomen. The abdominal wound was then closed.

The temperature of the patient stayed high for a few days, but convalescence was uneventful, except for a slight attack of delirium, the reason for which was not ascertained.

The administration of calomel and sodium phosphate was started four hours after the completion of the operation. This early resort to laxatives I consider a valuable adjunct in the treatment of operative cases where the continuance, or occurrence, of inflammation of the peritoneum is feared.

The orifice seemed, from its appearance, to be of congenital origin. If the patient's condition had been better, an attempt would have been made to close the mesenteric hole with a flap of omentum or peritoneum. As his pulse was 118 and his temperature  $101^{\circ}$  before operation, and there was evidence of peritonitis, it was thought best not to add risk by prolonging the operation.

CASE II.—*Intestinal Obstruction from Constriction of a Portion of the Bowel at the Internal Inguinal Ring. Death.*—The man, aged 30 years, was seen in May last, in consultation with Dr. C. Z. Weber, of Norristown, who, five days before, had been called to treat him for abdominal pain and vomiting of one day's standing. There was no fever; but the vomiting soon became stercoraceous, so that Dr. Weber, after securing only a few scybalous masses as the result of rectal injections, advised operative exploration. The family at first refused to give permission to surgical interference, but finally consented.

When we saw the patient in consultation, his temperature was  $100.4^{\circ}$ ; his pulse, 120; he was slightly delirious, and was troubled with persistent hiccough. Vomiting had continued, and there was a fecal odor to the breath; but the abdomen was flaccid and not tympanitic. There was thought to be slight distention of the abdomen in the epigastric region. Pressure on the abdominal wall caused gurgling, and after etherization a sort of swashing sound was elicited in the intestines when alternating pressure was made with the hands. The patient had no special pain in the abdomen or elsewhere. There was a history of a former inguinal hernia on the left side, which had always been controlled by a truss. At the present time no swelling or prominence existed in the groin.

An incision in the median line of the abdomen at once disclosed congested small intestine; and my fingers, immediately carried to the left internal inguinal ring, found the small intestine fastened there. A portion of the wall of the bowel had entered the ring, as in a Littre hernia. It was easily disengaged from the hernial opening. There were no adhesions.

The man's condition was such that it was not thought wise to search for other points of obstruction, since the obstructive constriction relieved was sufficient to account for the symptoms.

The delirium and hiccough continued, and death occurred on the second day.

**CASE III—Fatal Strangulation of the Bowel by a Persistent Vitelline Cord.**—The man, a patient of Dr. H. A. Stout, of Wrenonah, was beyond middle age and had suffered with complete obstruction of the bowels for five days. When I saw him his temperature was below  $96^{\circ}$ , his abdomen greatly distended, and he had stercoraceous vomiting. Preparations were made for an immediate exploration. During the hour that was consumed in preparing the room for operation and in sterilizing the instruments, the patient's extremities became cold, and his face covered with clammy sweat; and he died collapsed just as etherization was begun.

The autopsy showed no evidence of peritonitis, but great distention of the small intestine down to a point about sixteen inches above the ileo-cecal valve. The bowel from this point to the cecum was collapsed and deeply congested.

Investigation showed that this loop of bowel was encircled by a thin cord of tissue, looking very like white string of about the size used for tying grocers' parcels. This band or cord, which was 13 cm. long, was attached at one end to the parietal peritoneum on the front of the abdominal wall and at the other to the mesentery above the upper portion of the constricted bowel. From another portion of bowel hung a pedunculated mass of tissue,  $4\frac{1}{2}$  cm. long, which looked like several lymphatic glands held together by connective tissue. The thread-like band previously mentioned ran through a little opening in this appendage, as a cord is run through a pulley. The appendage was attached to the intestine opposite the mesentery, but had no opening in it as would be expected if it were a Meckel's diverticulum. It may have been an altered diverticule. The constriction of the bowel by the white, round cord was so tight that the portion of intestine toward the cecum had a dark line at the bottom of the groove made by the cord, similar to the congested gangrenous line often seen in tightly strangulated hernias.

The specimen was shown and the case reported at the meeting of the Philadelphia Pathological Society in October, 1897, since which time I have concluded that the cord was a vestigial structure—the remains of the omphalo-mesenteric, or vitelline, duct.

Strangulation by such embryonic structure is not very rare, though the accident occurs more frequently probably from Meckel's diverticulum than from a cord remaining as a vestige of the omphalo-mesenteric vessels alone.

Dr. Riesman read before the Pathological Society last May a paper on Meckel's diverticulum and the omphalo-mesenteric duct<sup>1</sup> which confirms the opinion to which I arrived some time after presenting the specimen.

Relief could have most readily been given to this man by early operation. All that was required was to tear or cut the thread of tissue that constricted the ileum.

These cases show the importance of early operative interference. We must all learn that purgatives are dangerous in suspected

<sup>1</sup> *University Med. Mag.*, June, 1898, p. 526. See also Fitz, *Am. Jour. Med. Sci.*, July, 1884; Kammerer, *Annals of Surgery*, August, 1897; and Thompson, *Annals of Surgery*, April, 1898.

intestinal obstruction and that a surgeon should be called in consultation as soon as enemas efficiently given fail to relieve the

obstruction. Many lives will be saved by the recognition of the necessity of such a course of treatment.

### DISCUSSION.

DR. JOHN C. DACOSTA endorsed Dr. Roberts' words urging the necessity of prompt interference. It is sometimes difficult to distinguish cases of intestinal obstruction from those of obstinate constipation. Of special interest to Dr. DaCosta was the case reported as having an encircling fibrous band. He has seen several cases having an obstruction of the intestine that it was impossible to diagnose before operation. The bowel, in these instances, was encircled by a band resembling organized lymph. He discovered such a case recently upon opening a woman for another trouble. He found that her obstinate constipation was due to large bands of lymph encircling the intestine. The resulting constriction would probably have killed her. As it was, after operation she made a good recovery.

DR. J. M. SWAN referred to a case seen by him this winter, and asked what could be promised to the families of patients suffering from intestinal obstruction when exploratory operation was advised to relieve the condition? In February, during the absence of the family physician, Dr. Swan attended a man, about 70 years of age, who was suffering from obstinate constipation. The question of malignant disease of the bowel presented itself, but examination of the rectum, as far as the finger could reach, gave no evidence of tumor. The possibility of appendicitis was also thought of. Purgatives were given without result, but the bowels were finally moved by oil enema. The possibility of the presence of appendicitis was suggested to the family physician on his return, but having seen the patient through several similar attacks, he did not seriously consider it. The patient improved, but in the latter part of April he suffered from another attack of obstinate constipation. An oil enema was ordered, but was ineffectual. The next day stercoraceous vomiting began. A surgeon was called in and advised operation, which revealed an annular carcinoma encircling the beginning of the sigmoid flexure of the colon. The patient died

during this operation, before an artificial anus could be established. If this man had been operated on in February, the most that could have been done for his relief would have been the establishment of an artificial anus, or, perhaps, the performance of an intestinal anastomosis. Instead of operation at that time, when the patient's condition was fair, he was allowed to wait until he had a second attack of obstinate constipation, and then he died on the table. The question of prognosis in such cases seems very important. It may not be said that everything will be easy, that the operation will go off all right, and that the patient will recover. There will be a certain number of deaths. Dr. Swan believes in taking the risks. As a young man, however, he invited advice from his elders as to what should be said to patients and to their families when early operation is advised in cases of this character.

DR. G. I. MCKELWAY inquired whether Dr. Roberts in the first and second cases considered the possibility of appendicitis. Dr. McKelway recognized that Dr. Roberts found certain conditions that might be coincident with some other conditions that might have been more serious. Dr. McKelway also dwelt on the importance of exploratory incision. In a well person this is a harmless procedure when skillfully and properly done, and it is difficult to imagine a valid objection to it in such cases as have been recited by Dr. Roberts and by Dr. Swan.

Furthermore, may not some of the cases believed to be exceedingly obstinate constipation be obstruction of the bowel due to some cause that is not recognized, or arising from conditions similar to those recited by Dr. Roberts? Finally, may not efforts at relieving the bowels set up very violent peristalsis and so relieve such a condition as was spoken of by Dr. Roberts in his first case?

DR. GEO. ERETY SHOEMAKER held that it is very important to distinguish at an early period cases of obstinate constipation from those of definitely obstructive charac-

ter. It is not always an easy thing to do, but certainly the general condition of the patient should do much toward the determination of the question. In fecal impaction elevated temperature or a very low temperature is rarely seen; certainly it is not attended by stercoraceous vomiting and it is quite free from serious disturbance of the pulse and the abdominal signs of beginning peritonitis. The mistake is made in persisting too long in measures which are effective for fecal impaction only. If one gets no effect from small, frequent doses of calomel or salts, and from high enemas given with the body in an inverted position, as with the patient resting on knees and chest, within 12, or at most 24 hours, it is assuming a grave responsibility to persist with medication. It goes without saying that ordinary surgical conditions, such as strangulated hernia, should be excluded before medication is used at all. Dr. Shoemaker has sometimes succeeded in opening the bowels when the patient was supposed to be suffering from obstruction, but this does not prevent him from insisting on the early employment of ordinary surgical measures in cases where they are demanded.

DR. S. SOLIS-COHEN said that he had some contradictory experience. He had strongly urged operation in cases he believed to be obstruction, and patients had refused to be cut and had triumphed by getting well without it. Unfortunately, he had also seen death occur in a case in which he thought operation had not been necessary. Anything which can throw light upon the subject is certainly to be welcomed. One thing that has led to delay in operation might be illustrated by an experience of his. Called in consultation by a physician who had given injections without result, at his suggestion the injection was repeated in a different manner, but also without result. The patient having been sent to a hospital for operation the surgeon in charge said that the injection had not been given properly and he gave another, without result. The next day operation was done and the patient died just as the volvulus was discovered.

On the other hand, a patient, past 70 years of age, who had inguinal hernia, was seen in consultation with a competent surgeon, who had been attending him for some time and treating him by properly-given

injections and similar measures. The man was vomiting, was not purging; the surgeon felt confident that there was no strangulation of the hernia, but thought that there was some mechanical obstruction of another kind, probably impaction of feces. Dr. Cohen concurred with him that operation was necessary. The family declined and the patient declined. Another good surgeon also insisted that operation was necessary, as did a third surgeon of eminence; the family consented—and then the patient got out of bed and passed the feces. Thus the question of operation is not always easy to decide. Yet, when after careful consideration operation has been decided upon, it is well for the physician or surgeon to persist in his judgment and let the family and patient take the responsibility of declining.

Referring to persistence in medication, Dr. Cohen said that, in his early experience in the Out-Patient Clinic of Jefferson Hospital, a patient stated that he had no motion of the bowels for three weeks. Professor Da Costa diagnosed simple impaction. The man was sent into the wards, and kept for several days, possibly two weeks, on small doses of opium and belladonna, and then his bowels moved. This was not purgative treatment, it is true, but it was persistent medicinal treatment by one who had firmly decided in his own mind that medicine was equal to the occasion, and in a patient in whom grave symptoms did not develop.

DR. JOHN B. ROBERTS believes with Dr. Shoemaker, that the temperature-record is of great value in determining whether a case is one of simple constipation, or of obstruction. The important thing to realize, and the average physician does not realize it in these cases, is that it is absolutely wrong to give purgatives. If any movement of the bowels is to be obtained, it should come from large enemas of oil, or of some other material. There are so many methods by which obstruction may occur, and one should not wait very long before operating. With increasing experience, Dr. Roberts believes more in operating early. An opening in the abdomen permits one to see the condition of the bowel, and whether or not it is mechanically obstructed. Physicians, in their own families, in Dr. Roberts's opinion, should prefer early to late operation.

## THE TREATMENT OF EXOPHTHALMIC GOITER WITH SUPRARENAL SUBSTANCE—EXHIBITION OF CASES.

BY SOLOMON SOLIS-COHEN, M.D.

Read September 14, 1898.

AT the meeting of the American Medical Association, held in Philadelphia, in May, 1897 (*Journal of the American Medical Association*, July 10, 1897) I presented several cases of exophthalmic goiter, and reported others to illustrate the treatment of this affection by means of preparations of the thymus gland and of the suprarenal gland. Contrary to the summary of experience made by Putnam in his article upon the subject of internal secretion (*Amer. Jour. Med. Sc.*, vol. cxv, pp. 31-49), my experience with thymus had been quite favorable; for out of six cases so treated and followed up, four simultaneously showed a much greater degree of improvement than could have been anticipated from merely hygienic management or from the well-recognized tendency to spontaneous recovery in certain cases of Graves's disease.

My observation with suprarenal preparations at that time was more recent and less extensive; but I was inclined to think from my limited experience that it would prove even more useful than the thymus.

This idea was based upon the conception that I entertain of the pathologic synthesis of Graves's disease. Whatever may be the primary fault in that affection and whatever may be the lesions found or unfound at autopsies, the symptoms taken as a whole point to a loss of control in the nervous apparatus regulating the caliber and motions of the bloodvessels. The old idea that the circulation depends almost, if not entirely, upon the heart, and that the bloodvessels are merely passive canals for the transit of the blood, is in process of abandonment by physiologists, and the active part in circulation performed by the peripheral mechanism is coming to be more

and more recognized. An important portion of this peripheral mechanism is the active contraction and relaxation of the bloodvessels; and ataxia of the vasomotor system interfering with the symmetry and harmony of these processes, manifests itself in various and mostly irregular forms; sometimes, however, constituting a more or less coherent symptom-group such as that which we term Graves's disease or exophthalmic goiter. In this affection, while there is often a tendency to undue contraction of some portion of the vascular system, the phenomena are, on the whole, those of undue relaxation; and much of the rapidity of the heart's action can be attributed to the mechanical effect of the loss of vascular regulation.

Laboratory studies of the suprarenal substance show that it has, among other properties, the power of regulating, and especially of heightening the blood pressure through contraction of the bloodvessels; though the exact mechanism by which this contraction is brought about remains an undecided question. It is also well known that in certain cases of exophthalmic goiter there occurs a pigmentation sometimes hardly to be differentiated from the pigmentation of Addison's disease, and in a marked instance, which I have elsewhere reported, one good observer had diagnosticated as Addison's disease, and another good observer as Graves's disease, a case which I was unable to place definitely in either of these categories; looking upon it rather as an instance of vasomotor ataxia, in which the abdominal sympathetic system was principally affected. In the negative aspect of this diagnosis, both as to Addison's dis-

ease and as to Graves's disease, Prof. J. M. DaCosta concurred. The patient has recovered.

From these, and like considerations, it seemed to me probable that the administration of preparations of the suprarenal gland would be useful in Graves's disease through its action upon the bloodvessels, antagonizing directly the more prominent morbid phenomena. In private practice I have as yet had no opportunity to make a sufficiently extended observation. While I have written to a number of gentlemen whom I have counseled to use this treatment, enquiring as to the result, the time has been too short to receive the desired information. At the Philadelphia Polyclinic the treatment has been employed in some eight or ten cases, but we have been able to follow it up satisfactorily in but four patients, three of whom are presented this evening, and who were among those brought before the American Medical Association in May, 1897. At that time they had all improved, but remnants of goiter or of exophthalmos were still visible or palpable. At present, their condition speaks for itself. We seem to be justified in claiming curative results and in attributing this directly to the use of the suprarenal substance. As stated in my paper before the American Medical Association, while for purposes of study one prefers to give the thymus gland and the suprarenal gland separately, it is probable that in the treatment of exophthalmic goiter the best results can be obtained from their joint administration. I have noticed again and again what may be termed the opposing temperature relations of the thymus gland and the thyroid gland—that is to say, that patients who in summer are subject to marked relaxation of the vessels, with excessive sensitiveness to heat and undue readiness of perspiration, are harmed by the administration of thyroid substance and benefited by the administration of thymus substance. And conversely, those who in winter suffer extremely from slight degrees of cold, are harmed by the administration of thymus gland and benefited by the administration of thyroid gland. Similar relations exist between the suprarenal and the thyroid. It is to be hoped that the studies now being pursued by physicians and pathologists into the internal secretions and into the functions and disorders of the thyroid, thymus, pitui-

tary, adrenal and other ill understood organs may throw light upon the philosophy of these relations. For the present, we may be justified in accepting the clinical observations as a basis for rational empiricism in treatment.

The cases herewith presented may thus be briefly summarized:

CASE I.—Miss L. This was a mild case, treated with thymus extract only. She was well when presented to the American Medical Association and has remained so since. She would probably have recovered under any treatment.

CASE II.—Mrs. B. This patient had had her exophthalmos and goiter for fifteen years before coming under treatment. When first affected, following a confinement, she was treated by a homeopathist and partially recovered. The improvement was not lasting, and for about two years she had suffered much with palpitation of the heart, the neck had again enlarged, and the eyes became more prominent. The immediate cause of seeking advice was rheumatoid arthritis with much pain in the finger-joints. She came under observation May 25, 1896. The administration of thymus substance, 5 grains daily, increasing to 25 grains daily, was attended with great improvement. The goiter and exophthalmos diminished; and the pulse-rate fell from 150 to 96. Nervousness was much diminished. After five months of this treatment her condition remained stationary—partial recovery. On November 15, 1896, suprarenal substance was given in doses of 5 grains daily. This was increased to 30 grains daily, and then diminished to 10 grains daily. The patient has taken no medicine for a year. She stopped attending the clinic because "the skin of her neck was getting too loose" where the tumor had been. The exophthalmos is scarcely perceptible. The pulse-rate is 84. The heart's action is rhythmical and of normal force. There was presystolic murmur at the apex, which persists. There was pulmonic murmur, which has disappeared.

CASE III.—Mrs. McEld. came under treatment August 7, 1895. For some weeks she had had dyspnea and difficulty in swallowing. Examination revealed a goiter as large as a small orange, particularly affecting the isthmus and left lobe, soft, elastic, but not presenting a thrill. She had noticed the enlargement of the neck for about



two years, following a great sorrow. There was almost Addisonian pigmentation of the face and hands; tremor of the hands; general nervousness; venous hum in the neck; occasional tachycardia. Exophthalmos was present, but slight. The patient improved rapidly on thymus substance, but became much worse when thyroid was inadvertently given. At the meeting of the American Medical Association, she was exhibited as a case of partial recovery under thymus treatment. She was then given suprarenal substance, and in two months the goiter had entirely disappeared. For more than a year she has taken no medicine, and there is now a slight recurrence of goiter, scarcely visible, but quite evident on palpation, for which treatment will again be instituted. The exophthalmos is gone. The complexion is much lightened in color.

CASE IV.—Adolph S. still shows exophthalmos in slight degree, and tachycardia recurs upon excitement, especially fright. His hands are just now quite moist, although it is not warm. He has taken no medicine for 6 months.

I would call especial attention to the symptom for which he sought advice—blood-spitting, true hemoptysis. He supposed he had tuberculosis. Physical examination disclosed no pulmonary lesion, and microscopic examination failed to find tubercle bacilli in his sputum. He has been treated with suprarenal substance only; 10 grains daily is his limit. Larger doses produce nausea, vertigo, and sometimes fever. It will be advisable to give him the drug again, I think, for a week in every month, to perfect the recovery.

## DISCUSSION.

DR. BRICK expressed his interest in the organo-therapy of exophthalmic goiter, and his belief in Dr. Keen's and Dr. Da Costa's statement in the American Year Book for 1898, that it is distinctly a medical disease. Lemke takes the opposite view and says it is a surgical and not a medical trouble. In a paper read before the British Medical Association, August, 1896, Murray compares the thyroid gland in exophthalmic goiter to a compensatory hypertrophy which has taken place in the gland after a partial thyroidectomy. He states that in the hypertrophied gland there is an increase in the number of alveoli, an increase in the internal epithelial surface, and a change in the character of the epithelial cell from the cubical to the columnar type. In exophthalmic goiter there is an increase of secretory tissue; the number of alveoli is increased, and the epithelial cells are columnar, showing the strong resemblance of the thyroid gland in these two conditions. The surgeon frequently sees cases in which medical treatment has failed, and which demand operative intervention, either on account of grave toxemia or of dyspnea. What are the alternatives of surgical treatment? There is the injection method of iodine, and glycerin and iodoform, both of which are infrequently used at present, although in the

hands of one operator the injection of iodoform and glycerin has produced good results. Another method is that of exposing the gland, or thyroidotomy, but this procedure is not without danger of thyroid intoxication and its risk is considerable, as death has followed in several cases. Treatment by ligation of the thyroid arteries requires a first-class operator who is not afraid of hemorrhage and who knows his anatomy. In the hands of Kocher and Rydygier it has proved fairly successful. Ligation of the thyroid arteries has not proved to be a cure for the disease. The statistics of Kocher and Rydygier read very well, but it is not the consensus of opinion that this operative procedure is the best. It is known that complete thyroidectomy produces myxedema, while partial thyroidectomy, which embraces four-fifths of the cases yet reported, has a large number of recurrences, and as reported in the *Lancet*, Sept. 10, 1897, there are cases in which sudden death may follow toxemia from what Horsley believes to be the absorption of the thyroid secretion following an operation. The great danger of taking an anesthetic in these cases, and the friability of the vessels and capsules, combine to discredit partial thyroidectomy as an ideal operation. The remaining operative procedure is either

unilateral or bilateral excision of the cervical sympathetic nerves. Attention has been called to the operation by Jonnesco, of Bucharest. As first done by Alexander, of Liverpool, for epilepsy in 1889, the results were good.

Prof. Jonnesco calls attention to the observations of Recklinghausen, Virchow, and others, that both in exophthalmic goiter and epilepsy, there are lesions presenting an acute hyperemia of the cervical sympathetic and an atrophy of the nerve-cells, accompanied by consecutive peripheral and interstitial proliferation. His theory was that of Abadie, that if one could interfere with the cervical circulation by resection of the nerve it would have an influence on the epilepsy. Jonnesco reports a case with entire cessation of exophthalmos, and of the goiter. Jaboulay, of Lyons, has done the operation a number of times.

Dr. Brick's aim was to call attention to the surgical alternatives open to those cases in which medicine has failed. Horatio Wood recommends splenic extract, but thymus extract is undoubtedly better. In the acute cases accompanied by grave dyspnea, and in which operative procedure is necessary, the best method seems to be that of unilateral or bilateral resection of the cervical sympathetic nerves by the method of Jonnesco.

DR. J. CHALMERS DACOSTA said that a successful medical treatment of exophthalmic goiter is eminently to be desired. The proper surgical treatment is, at present, not certainly determined upon. The operative statistics furnished have been, to some extent, representative of the taste and fancy of writers. Authors in favor of partial thyroidectomy furnish most gratifying statistics of their favorite method, and authors who advocate resection of the cervical sympathetic supply statistics of the most pleasing sort. Nevertheless, the latter operation has been done by comparatively few people. From a surgical standpoint it must always be a difficult procedure, restricted to the few who have the facilities of a hospital and excellent help, and any operation for exophthalmic goiter possesses elements of danger and uncertainty.

In regard to the administration of suprarenal extract for exophthalmic goiter Dr. DaCosta was without experience. At a recent meeting of the London Society of

Anesthetists it was stated that this remedy has a powerful effect in preventing the fall of blood-pressure which is caused by chloroform. It was agreed to by many members present that this remedy is the most powerful of all agents known in antagonizing the fall of blood-pressure that is responsible for many disastrous consequences in chloroform-anesthesia. That it has this power points to its mode of action in Graves's disease.

In regard to thyroid extract the experience at Jefferson Hospital has been somewhat limited, but in several cases it seemed as if it definitely increased the symptoms.

The paper of Dr. Cohen was of much interest to Dr. DaCosta, who thought it should be borne in mind and similar treatment applied to an enlarged series of cases. In concluding he agreed with Dr. Brick that surgical treatment is necessary for severe dyspnea or toxemia in cases of exophthalmic goiter.

DR. MATTHEW WOODS stated that Dr. Stillé was unlike Solomon, inasmuch as Solomon said, "There are three things too wonderful for me, yea, four which I know not;" while, Prof. Stillé said there were four things in medicine which he, on the contrary, absolutely knew, while there were a great many which he didn't. He almost absolutely knew, he said, and repeated it many times, that mercury and potassium iodid would cure syphilis; that quinin, with removal from the malarial district, would cure ague; that large doses of tincture of ferric chlorid would abort erysipelas; and that electricity, combined with the internal administration of iron, would cure exophthalmic goiter.

This made such an impression on the mind of Dr. Woods that he sought sedulously for an opportunity to try Dr. Stillé's infallible remedy in the latter disorder—the others do not need to be sought after—and during a quarter of a century he had succeeded in bringing himself in conflict with four cases and in vanquishing them. In the four cases mentioned the remedies were, electricity applied to the enlarged thyroid, and iron given internally, while the patients were kept in as good sanitary condition as possible.

The tendency to spontaneous cure was illustrated in another case seen by Dr. Woods, where the patient, after being under

treatment for a short time, and before it had any perceptible effect, moved to a distant part of the country. In two years all symptoms of the disease disappeared simultaneously with improvement in the general health of the patient, due, without medicine, to changed circumstances and removal to another neighborhood.

The fact that one patient in Dr. Cohen's carefully-studied and interesting series had had Basedow's disease fifteen years before, and had been treated successfully by a homeopathist, would indicate, at least to a serum-therapy skeptic, that expectancy on the part of the patient, associated with improved hygienic and nutritive condition, may have had as much to do with the cure of the disease as the administration of desiccated gland.

Doubt was expressed by Dr. Woods concerning theories based upon animal experimentation. There seems so much that is fantastic and medieval, he said, in the thought that the secretion of a gland will cure disease of that gland, that he always receives such statements with doubt, and tries to find some other explanation by which the cure was effected. He thought that perhaps the other parts of the treatment adopted by Dr. Cohen had as much to do with the cure of this disease, as did the secretion to which he seems to think all the benefit may be ascribed.

The almost universal use of *sargassum* or goiter-stick in certain parts of South America, where both goiter and exophthalmic goiter are frequent, with reported cures enough to justify, at least, lay confidence, would indicate to Dr. Wood, that after all Professor Stillé's remedy is still, as a remedy, more in harmony with the somewhat conjectural pathology of the disease, than any that has yet been recommended.

DR. S. SOLIS COHEN, in closing the discussion, said that, in the paper, he had explicitly mentioned the well-known tendency of cases of exophthalmic goiter to recover spontaneously. He had witnessed such recovery again and again, and recognized that every observation made in this disease is conditioned by that possibility. At the same time, it is also true that many cases fail to recover under varied and extensive treatment, and it is hardly likely that six severe cases under the care of the same observer at the same time will all recover spontaneously.

The probabilities are against it. It was not the speaker's intention, in the paper, to discuss all the methods of treatment applicable to this affection, but to demonstrate the results thus far achieved with one method—a new and original method, not yet sufficiently tested. There are very many methods, concerning which both success and failure have been reported. His own experience with electricity had been absolutely negative. The only points of the observations reported that evening were that, in a certain number of cases, recovery from the symptoms of exophthalmic goiter had followed the administration of preparations of the thymus gland and of the adrenal gland; and the suggested explanation, *i. e.*, the physiologic action of the remedies upon the bloodvessels. So opposite is this experience to the cure of a disease of a gland by the administration of the secretion of that gland, that it was distinctly stated both by Dr. DaCosta and the speaker that the administration of thyroid gland to patients with exophthalmic goiter is generally harmful. It is fair, however, to say that Dr. Cohen has had one patient who offered an exception to this rule. Under treatment with thyroid, he recovered so far that he eloped from the hospital on refusal to give him his discharge because it was wished to see whether the recovery would persist. A few similar exceptions have been recorded; but the vast number of reports are almost uniform, that the administration of thyroid gland in exophthalmic goiter does harm. The patients exhibited had received no tonic treatment. The only medicine given was thymus gland or adrenal gland. No attempt was made to do anything else, because the attendants were wicked enough to wish to experiment upon animals; in this instance, upon animals of the genus *homo*. Of the two wickednesses, the speaker considered that experiments upon lower animals would be the less; but in this therapeutic experiment the only animals available are human beings. Dr. Cohen has sufficiently developed the bump of skepticism to criticise all his own observations upon treatment, and he would not have brought the cases before the Society were he not convinced from a sufficient study that in them the recovery has been not simply coincident with the treatment, but rather on account of the treatment.

Suprarenal gland is the best available

agent for the regulation of blood-pressure. Dr. DaCosta had called attention to an observation which has been made of its antagonism to chloroform paralysis of the vaso-motor system. Dr. Cohen has, in his own person, experienced its antagonism to the vaso-motor paralysis of hay fever. Previously he had used picrotoxin for the same purpose. Dr. Bartholow has described the action of the last-named drug as practically the joint action of strychnin and belladonna.

He had seen in Dr. Bartholow's clinic excellent results from the conjoint use of ergot and picrotoxin in exophthalmic goiter. Atropin and strychnin form a useful combination in certain types of asthma; picrotoxin often acts equally well. Suprarenal substance, however, seems better in Graves's disease and in the vaso-motor parietic type of asthma than any remedy drawn from the vegetable kingdom. Thymus extract is a good adjuvant.

# THE PREVALENCE AND THE PREVENTION OF PUERPERAL INFECTION IN PRIVATE PRACTICE.

[ABSTRACT.]

BY GEO. ERETY SHOEMAKER, M.D.

Read September 28, 1898.

THE battle over the question of the contagiousness of puerperal fever was won more than forty years ago. The principles of its prevention have long been applied in lying-in hospitals, and the value of certain methods is not for one moment questioned. By a curious anomaly the status of the private patient cared for in her home is entirely different, and she is subjected to unnecessary risks which the poor in hospitals do not assume. It is impossible to obtain public record of death from puerperal fever, other causes of death, such as typhoid fever or peritonitis being given. The consultant obstetrician or gynecologist sees many cases. The mortality in large cities in the better class of private practice, is two or three times as great as in lying-in hospitals. Reasons for this relate to the less resisting power to infection of patients unaccustomed to unclean surroundings; to the unwillingness of the community to tolerate any decided departure in the preparation of the lying in room from ordinary household conditions; most of all to the attitude of opposition or

indifference among a considerable number of physicians in city or country toward any painstaking effort at asepsis.

Renewed attention was called to the valuable evidence from actual cases cited in Dr. O. W. Holmes' classical essay on the contagiousness of puerperal fever. The risks are the same to-day, if physicians go from cases of erysipelas or infection to labor cases. The essentials for practical obstetric asepsis were stated as being very few. Four things, if carefully used, would largely banish septicemia: (a) A new, cheap, hand scrubbing brush for each case, used ten minutes on the physician's hands with hot water and soap; (b) bichlorid solution for hands and external genitals; (c) napkins of any absorbent material folded to proper size, *baked*, in quantity, *for an hour*, in any oven, and taken from the original bundle one at a time; (d) a cheap white cotton suit, coat and pantaloons, carried to each case by the doctor and worn over his ordinary clothing; cost less than three dollars.

## DISCUSSION.

DR. C. P. NOBLE said that experience shows that in private practice puerperal sepsis still exists. Therefore it is of importance to know how to limit it. Investigations as to its prevalence in private practice have failed to arrive at any accurate estimate of its frequency, but the researches of Hermann show that it is very frequent in London, and the experience of most consultants in the United States, in the cities at least, shows that sepsis in childbed, particularly in cases of

miscarriage, is common. With Dr. Shoemaker, Dr. Noble believes that sepsis may be limited in private practice by simple means. All that is required is an earnest purpose, on the part of practitioners, to put simple principles into use. The remarks of Dr. Shoemaker regarding the patient's environment were very practical. In many cases it is extremely difficult to command aseptic conditions of furniture and of rooms. This is not so with intelligent people, who will

prepare a room especially for confinement and have things clean, in a domestic sense, and particularly the things about the bed, if they are told why the rag bag should not furnish the material for obstetric dressings. The graver difficulty at this time, and a decreasing one, is with the so-called "granny" nurse; until she is displaced by the trained nurse a certain amount of sepsis must occur. From the practitioner's standpoint this question has been much simplified by the recent teaching that there is little to be feared from any bacteria contained in the vagina of healthy pregnant women. The only exception is in the case of women who have vaginitis, from infection of various kinds. If the practitioner can satisfy himself that the particular patient has no symptoms indicating inflammation of the vagina, if she has no irritation or unusual discharges, he can, with perfect safety, from the standpoint of preventing puerperal sepsis, omit antepartum douches. Asepsis, in labor cases, comes down to the question of disinfecting the genitals of the patient and of disinfecting everything which may come in contact with them. This means the hands of doctor, nurse, instruments, employed, etc. There should be liberal use of the nail-brush, not only for ten minutes, but even longer. When subjected to contagion, as by attending septic cases or those of diphtheria and erysipelas, the practitioner should, if possible, avoid attending labor cases. If he does attend them he should change his clothes and not only take a bath, but scrub himself as thoroughly as he would for an abdominal section, and use in addition to soap and water potassium permanganate and oxalic acid. Even then, if the hands are infected with purulent streptococci, there is no safety in even the best means of hand disinfection. That has been proven so many times that the profession must accept it. The practical outcome of this knowledge is that if the practitioner is exposed to erysipelas, diphtheria, etc., it is a safe rule to avoid attending labor cases for several days, just as the abdominal surgeon exposed to septic cases is not safe to attend a case within 48 hours.

DR. R. C. NORRIS recognizes obstetrics as the specialty of the general practitioner. With Dr. Shoemaker he remarked the notable improvement of results in hospitals as compared to private practice. Grave puerperal sepsis has been almost wholly

eliminated from properly conducted lying-in hospitals. The experience of Dr. Norris contributes to the belief that it can almost always be avoided. The Preston Retreat, in his charge and in that of his predecessors, has had, up to the present time, 2,500 consecutive deliveries without a death from puerperal septicemia. This result can be accomplished in similar institutions. Much depends on the patient coming to the hospital at the proper time. In private practice septicemia is still present. To find its cause one must finally rely upon his own experience in consultation work, which often enables one to estimate the attendant's knowledge of asepsis. In the present month Dr. Norris saw in consultation six cases of sepsis, and in no instance could he find fault with the patient's surroundings. The old idea that the room may be a large factor in carrying sepsis to the obstetrical patient should be disregarded, and attention concentrated on the fact that infection is derived from contact with unclean fingers, instruments and clothes rather than from atmospheric conditions. Some men are personally incapable of antisepsis or surgical cleanliness. An example is that of a physician who made a bichlorid solution for disinfection with dirty, soapy water. Bichlorid has done much good, but also great harm by creating such reliance on its inherent power that the more important part of thorough cleansing, that with soap and water, is often overlooked.

There are, therefore, two classes of derelict practitioners, those who have no accurate knowledge of the details of surgical cleanliness, and those who have, but whose personal carelessness prevents the practical application of the principles of asepsis. In the production of infection the nurse may be a factor as well as the physician. Until people are sufficiently educated to procure a surgical nurse for an obstetric case, sepsis may be expected. Again, there are two classes of physicians whose faulty judgment increases morbidity and mortality after delivery: those who never have, nor never see infection when present, thus losing the opportunity for early aggressive treatment, and those of the younger men, who are so keenly alive to infection, as in one instance to mistake for it the effects of constipation, and treat the latter by uterine curetment. An example of the former class is that of a

woman treated for malaria, who had a foul vaginal discharge, and really suffered from an incomplete abortion. Prophylaxis is the main subject, and its observance is not laborious—infrequent vaginal examinations, the free use of soap and nail-brush, and under some circumstances, the employment of rubber gloves. The practical value of the last cannot be too strongly emphasized. They permit Dr. Norris to examine septic patients without infecting his hand, and so permit him subsequently either to open an abdomen or to deliver a patient without the fear of conveying infection by his hands. Without the gloves, he would consider this culpable since no method of hand sterilization can be absolutely relied upon. In surgical operations he grants that gloves are a great inconvenience, but in obstetric surgery the same amount of tactile sense is not required, and its whole field of work can be safely accomplished with rubber gloves. The repeated hurried examinations of women in labor are often a source of infection. To the busy family physician attending a confinement case the use of rubber gloves is valuable. They can be used at a cost of 25 cents for each case, since one pair of gloves will stand a ten minutes boiling six times, and, being dropped in any pan or dish and boiled, they can be relied upon as being surgically clean. This point cannot be too strongly urged. Its observance, when attending a septic case, saves many anxious moments and permits one to attend a case and remain uncontaminated for the next. The use of special clothing is important, but it does not necessitate that a suit be carried in a satchel. A clean sheet can always be had, and at the moment of delivery be suspended from the chest and shoulders. This will be a sufficient protection. The use of douches, once considered essential, has been responsible for much harm in private practice. It is sufficient to cleanse the vulva and vaginal orifice. It is the cleanliness of the obstetrician, of his instruments and fingers, and the determination of the presentation by external palpation and one vaginal examination, which in normal cases is allowed to suffice till the head makes its appearance at the vulva, that give the physician the greatest assurance of avoidance of sepsis.

DR. LEVI J. HAMMOND's experience, in spite of attention to the details outlined by Dr. Shoemaker, includes, he says, a cer-

tain number of infected cases. He thinks these cases have been almost invariably limited to those that have suffered some laceration along the birth track, and that the probable explanation of this subsequent infection is that metamorphosis of the ever present, and under normal conditions harmless, vaginal bacteria takes place from wound-secretion. Students of the University, under Dr. Hammond's observation, have closely adhered to the technic advised by Dr. Shoemaker and Dr. Norris, and yet they have a few cases of infection. These are attributed by Dr. Hammond entirely to the bacterial metamorphosis of the wound-secretion serving as the culture medium, consequently no amount of toilet on the part of the attendants could prevent infection from this source.

DR. R. A. CLEEMAN said that, except in cases of abortion, he thinks the subject of septic infection is overdrawn. He believes that some people are naturally more surgically clean, and that he has this good fortune. There may be something due to the condition of the skin of the physicians who report so many septic cases. Long before there was an understanding of sepsis and asepsis, Dr. Cleeman had results others did not have. Such an instance was the successful amputation, without antiseptics, of an arm that had been septic for three months. In his practice, he does not remember any case of septicemia, except such as have resulted from placenta previa, or a rupture of the cervix from turning. He remembers two such cases. The gentlemen who see so much sepsis are probably men who have more post-mortem examinations, and do more surgery. He does some surgery himself, but is not especially careful to be more than clean, and thinks it probable that the dangers of puerperal infection are exaggerated.

DR. HIGBEE has combated the dangers of puerperal sepsis by a system of midwifery. The charge of the trained nurse being above the means of a mechanic, two carefully selected women do his nursing at the reasonable sum of \$8 a week and intelligently carry out his directions. When called on to a case of confinement the physician and nurse wash their hands thoroughly with soap, water, and brush, and disinfect them with bichlorid solution. The nurse brings with each case a new skirt made of two layers of cheesecloth which is wadded to keep the patient warm. The skirt is sewed in a towel, baked

in an oven, and costs 60 cents. The patient is then thoroughly washed with soap and water and then with bichlorid solution, the skirt is now put on and she is kept covered. Soap only is used as a lubricant. This routine has been employed in a great many cases of confinement; they have all been free from sepsis, and the plan is practical for every family. The cloths that are to be used after the birth have all been washed by some member of the family and the nurse bakes them in the oven and uses nothing but them. Injections are not given, unless there are symptoms calling for them. When these measures cannot be thoroughly carried out and symptoms of very light sepsis arise, a dose of salts or a bichlorid douche generally clears up all the trouble.

DR. GEORGE I. MCKELWAY said it is the general belief that any old thing in the line of a washerwoman will do for a nurse. He thought most of the cases of sepsis originate from this cause. When he meets the "granny" nurse he first tries to keep her away from the patient, as much as possible, and secondly, he insists that she wash her hands with a solution of bichlorid of mercury when she has occasion to change a napkin. For the personal care of the patient and her baby he enlists the services of the Visiting Nurse Society.

DR. ANNA M. FULLERTON expressed the belief that sepsis sometimes arises from clots retained in the uterus due to its failure to contract. A lacerated cervix especially contributes to this condition, and when the tear is deep it should be repaired. It has been Dr. Fullerton's practice to guard against sepsis by the use of iodoform suppositories of 15 to 30 grains instead of giving a vaginal douche. She particularly so treats primiparæ, who are apt to have numerous small abrasions and lacerations in the vagina.

DR. D. A. LONGAKER said that subjective antisepsis of the doctor and nurse comprises this subject. The less the patient is examined internally before, during and after her delivery and the less she is douched the better. He never advises the douche, keeps the old nurse from the patient as much as possible, and emphasized the fact that he

gets his patients up to urinate after delivery as soon as necessary and has them empty their bladders so throughout the lying-in period. He has never seen harm result, but has seen benefit. It favors drainage and obviates the necessity of catheterization. He notes the daily condition of the lochia, forbids the use of old quilts, and thinks a clean, broad sheet about the hips during and after delivery answers thoroughly the purpose of a skirt.

DR. RACHEL SKIDELSKY, in practising among the poorer classes, strives to educate the attendants of her patients as much as possible. She has mother and child cleansed each morning by a representative of the Visiting Nurse Society, and herself visits the patient in the afternoon, thus the woman receives intelligent attention twice a day. To prevent accident she employs creolin in preference to bichlorid, for the hand-sterilization of the granny nurse.

DR. SHOEMAKER did not speak of nurses in his paper, because he had in mind the country as a whole and the profession as a whole. Trained nurses are almost unknown in small towns, and there is not sufficient demand for one even in very intelligent communities of 8,000 to 10,000 inhabitants. Throughout the whole country obstetric nursing is done by untrained women; they take their cue from the physician who has charge of the patient, and his standard is their standard. The fault lies at the door of the physician; not all physicians, but of the large class who laugh at asepsis. The prevalence of sepsis throughout the community can scarcely be gauged by the impression of one man. The fact that one man has not had a case does not affect it. Dr. Shoemaker has never had a case originate in his own practice since he was a student, then he had one in a case of version. He said his obstetric experience was nothing compared to that of many men. The mere fact that Dr. Norris has seen six cases in consultation in one month in the better classes of society, is an indication that this disease is not rare. Concerning the suit, the sheet is good; but the suit will cover a person all up during a long and anxious night; and the sheet will not.



## GONORRHEA OF THE UTERUS AND ITS APPENDAGES.

BY ANNA M. FULLERTON, M.D.

Read September 28, 1898.

IN 1873 Nöeggerath published an article on "Latent Gonorrhea" which brought the subject prominently under discussion, and which, at the time, excited much opposition. Since then, gynecologists have become convinced of the accuracy of many of his conclusions, and gonorrheal infection, because of the great number of maladies to which it may give rise, is considered a far more formidable disease than it was previously.

Gonorrhea has been defined as a specific catarrh of the mucous membranes, particularly of the genito-urinary system, caused by the gonococcus Neisser. Clinical experience and pathological investigations have, however, proved that the poison is capable of penetrating far beyond the mucous membranes and producing a general constitutional infection which may manifest itself by numerous extra-genital disorders. The specific germ has been found in various parts of the body quite remote from the pelvis, which suggests that were the methods of research, advocated by the bacteriologist, more generally employed, we might frequently find the virus of this disease to be the exciting cause of now inexplicable troubles.

Although the most common clinical manifestation thus far recognized as arising from the metastasis of the gonococcus is inflammation of the serous lining of one or more of the larger joints, cases of peri- and endocarditis (even where no joint affection existed), also pleuritis, meningitis, myositis, perineuritis and other affections have been directly traced to this source. Many have terminated fatally, as did the case of malignant septicemia in a man, reported in the *New York Medical News* of August, 1896, by Dr. J. M. Robinson, of Duluth. This attack, as shown by a careful autopsy,

seemed to be directly traceable to a chronic posterior urethritis—gonococci being found in the urethral pus. Pus was found in many of the small joints of the body, as of the fingers and toes.

Numerous careful observers have found that gonorrhea occurs frequently as a latent condition which may become acute, as the result of any process which for the time decreases the resistance of the infected tissues. The acute attacks thus instituted result sometimes in the most disastrous consequences entirely without fresh infection. Bruising of tissues by confinements, operations, or any trauma, may bring about conditions leading to increased activity on the part of the gonococcus, and producing acute attacks of urethritis, vulvo-vaginitis, endometritis, or salpingitis.

Dormant gonorrhea produces no evidence which will lead to its recognition, even the gonococcus is not always discoverable in the secretions from the parts. In such a state it may, through an exciting cause, become acutely virulent, at any moment, so as to be communicated to other tissues. May it not be possible that many cases of septicemia, arising from obscure causes, have their origin thus in the rejuvenation of gonococci which have lain dormant in some part of the economy, until conditions favorable to their activities should arise?

Gonorrheal inflammations of the vulva and vagina are more frequent and more virulent than are such inflammatory affections of the urethra and bladder in women. Once established in the vagina the disease usually becomes quite obstinate, and is very serious because of its liability to extend to the uterus and its appendages, giving rise to that form of pelvic inflammation which is, beyond all comparison, the severest.

The gonococcus seeks the racemose gland for its habitat, and we, therefore, often find gonorrhea as a latent disease in women in the compound racemose glands of the cervix.

Winckel, of Munich, in a report presented to the Obstetrical Congress of Vienna in 1895, in speaking of the spread of gonorrheal infection, considers that from the cervix the gonococcus makes its way through the uterine wall to the peritoneum, and ascends also to the mucous membrane of the uterine cavity.

Wertheim reports from his observations in Schauta's clinic that gonorrhea of the uterus produces in all cases an inflammation of the mucous membrane, which may be called an interstitial endometritis, with suppurative catarrh.

In many cases the chronic course of this inflammation leads to increase in the number of glands, or what is termed a glandular endometritis. But the mucous membrane is not the only portion of the organ affected. There occur in many cases inflammatory changes in the muscular tissue, and inflammatory infiltration of the connective tissue, at the expense of the muscular tissue. We thus obtain many of the indurated, enlarged uteri which form so troublesome a factor in gynecology. The puerperium, Wertheim considers to hold an exceptional position among the conditions which favor renewed activity on the part of the gonococcus, as it frequently leads to an extension of the gonorrheal invasion of the uterus. (See *Centralblatt für Gynäkologie*, Nov. 26, 1895.)

The frequency with which we meet with the conditions just described, and the amount of suffering caused by them, render the question of treatment all-important.

Should we be so fortunate as to see a patient early enough after the invasion of the uterine mucosa by the gonococcus, some operators think it possible by dilatation and curetment with irrigation of the uterine cavity, followed by cauterization, to prevent the spread of the disease to other structures. Others, among whom is Auvard,<sup>2</sup> of Paris, strongly object to the use of the curet in acute gonorrhea, believing that the trauma thus induced favors the spread of the disease. Some operators object to the use of irrigation after curetment of the uterus, contending

that septic particles are thus washed into the Fallopian tubes and become the source of later manifestations of trouble. They employ the curet, and follow this by a thorough cauterization of the uterine mucosa.

When gonorrheal disease has progressed so far as to produce organic changes in the deeper structures of the uterus, or when the tubes and ovaries are involved, dilatation and curetment seem to be not only of no avail, but an absolute source of danger, so far as extension of the disease is concerned.

Lesions left as a result of gonorrheal invasion of the tubes, such as their tortuosity, thickening, constriction, and very frequently their complete occlusion, render quite apparent the impossibility of treating salpingitis by applications to the tubal mucous surfaces, and also render most dangerous the attempt, for this purpose, at catheterization of the Fallopian tubes, as was suggested by Lewellyn Eliot, of Washington.

In the face of these difficulties, and with the very urgent subjective symptoms of distress induced by the disease, the question naturally arises: What is to be done with uteri and appendages so changed in structure, through the destructive effects of this poison, as to be a constant source of ill health?

In the earlier practice of operative gynecologists it was at first thought sufficient to remove the appendages when found thus diseased. But as the uterus which had been the avenue of transmission for the poison was found to be liable to subsequent attacks of inflammation incited by the gonococci; and as a uterus, deprived of its appendages was of no use, the practice came into vogue of removing the uterus as well as the appendages.

The evacuation of the purulent contents of diseased tubes and ovaries by vaginal incision and drainage, though advocated by some, has never come into general use, for the reason that the greater destructive changes induced in the tissues through the action of the gonococcus make it almost impossible to do in this way a thorough and safe operation for this condition, although this procedure may sometimes be found to be effectual in the treatment of pelvic abscesses resulting from trauma or puerperal inflammation.

Through the influence of the French school of medicine—and largely through the

<sup>2</sup> *Archives de Toxicologie et de Gynecologie*, Paris, Sept. 22, 1894.

teachings of Brown Sequard—a strong reaction has of late come about against the total removal of ovaries. Brown Sequard's theory that "every gland, whether provided with excretory ducts or not, gives to the blood a certain useful principle, the absence of which is felt by the general economy and made apparent after its extirpation or the destruction or modification of its functional activity by disease," has led great stress to be placed upon the constitutional effects of total oöphorectomy. The conservation of the ovary has, therefore, become the fad of many gynecologists—and an effort is made in operative procedures for the removal of the pelvic organs, to leave at least a small portion of ovarian tissue for the beneficial effect which it is supposed to exert upon the system.

In actual practice the conservation of the ovary has been found to lead to the necessity for numerous secondary operations, and to those familiar with the clinical history and the character of the lesions resulting from infective disease of the uterus and its appendages, this is not surprising.

In the opinion of many of our best operators it remains to be proved that total oöphorectomy does other than precipitate the menopause, which in persons of nervous organization or greatly deteriorated health is often temporarily accompanied by unpleasant phenomena.

It is a fact, as has been said by one eminent writer on the subject, that the "uterus and its appendages, even when they have been the theater of infection and traversed by pus-germs, are not always beyond functioning." The possible results of an attempt at child-bearing under such circumstances deserve to be taken into consideration for the sake of both mother and child.

The records of a few cases of gonorrheal disease, from among a large number that have come under my own care, may illustrate the futility of attempting conservative work in, at least, this class of cases.

CASE I.—A. B. was a child, 14 years of age, sent me through the Society for Prevention of Cruelty to Children. She had been the victim of rape about 2 months before I saw her, and was suffering from an acute attack of gonorrhea. The uterus, which was small, was pushed to the left side of the pelvis, while a large, fluctuating mass occupied the right side. Operative procedure being decided upon, the uterus was first dilated

and cureted, and then packed with iodoform gauze. An abdominal incision was then made. The mass on the right side proved to be a greatly-distended Fallopian tube, occluded at its outer extremity and adherent to the ovary. Both tubes and ovary were held down by recent adhesions, which being separated, the tube and ovary were ligated and removed. The tube contained blood, and pus. The appendages of the left side were injected. The tube was patulous, and the ovary free. In view of her youth, both were left. I subsequently heard of the patient but once, several months after the operation, when I learned that she still continued to suffer from pelvic inflammation, which appeared to affect her general health quite markedly.

CASE II.—B. L. was a girl, 16 years of age, with very similar history, and with the same symptoms. An abdominal operation was done. Adhesions were found to be so extensive as to require, after their separation, considerable stitching of the bowels. In this instance, the appendages of both sides were so markedly involved as to necessitate their removal.

CASE III.—M. A. was a young married woman, 24 years of age, who, during seven years of married life, had borne 4 children, and had two miscarriages. Upon examination, the uterus was found to be large and tender, the neck greatly hypertrophied and badly lacerated, the perineum extensively torn. The patient suffered from profuse hemorrhages from seven to eight days every month. Although the appendages were not healthy, there was no evidence of any accumulation of pus. I therefore suggested a dilatation and curetment, with amputation of the cervix and repair of the perineum.

The operation was followed by an acute attack of inflammatory trouble, accompanied by all the symptoms of acute gonorrhea—high fever, irregular chills, great muscular soreness, painful and frequent micturition, purulent vaginitis. In time, a well-defined swelling of both tubes appeared. As palliative treatment seemed to make no impression, it was decided to operate for removal of the diseased appendages. The uterus having been thoroughly cureted but a short time before, and a quick operation being desirable because of the patient's condition, the appendages only were removed. The tubes were distended with pus, the

fimbriated extremities occluded and adherent to ovaries that were also riddled with pus. The condition of the patient improved at once after operation, and recovery followed. I have seen this patient at intervals, several times since her operation, when she returns for a threatened recurrence of trouble with the uterus, which prompt treatment seems to keep in check.

CASE IV.—E. K., a woman 27 years of age, had been married ten months. She had borne one child before marriage, which had lived but a few months. The symptoms of an acute attack of gonorrheal inflammation were all present when I saw her. In addition, large masses were found lying in Douglas's pouch, which were diagnosed as pus-tubes, and abdominal section was advised. A large pus tube was found on the right side, involving the ovary and appendix vermiformis, to which it was densely adherent. The appendix was amputated, and both ovary and tube removed. Hematosalpinx of the left side, with occlusion of the tube and marked disease of the ovary, necessitated the removal of the remaining appendages as well. The uterus was curetted. The disease apparently not having extended, to any marked degree, to the parenchyma of the uterus, it was hoped curetment and cauterization might control the trouble, which they apparently did, so long as she remained under observation. Removal of the uterus would probably have been the better surgical procedure.

CASE V.—J. S., 25 years of age, was married at the age of 18 years, and had borne two children and had one miscarriage. The uterus was enlarged and indurated—large fluctuating masses were found on both sides. A purulent discharge came from the cervix. It was thought well to precede the abdominal operation performed in this case by a curetment of the uterus. The curet opened up an abscess in the posterior wall of the uterus, and passed through it into the pelvic cavity. Realizing what had occurred, I at once packed the uterine cavity with iodoform gauze, and proceeded to the performance of the abdominal operation. Uterus, tubes and ovaries being found riddled with pus, total extirpation was done. This patient's condition has been very satisfactory since her operation. Vaginal inflammation is kept in abeyance by means of antiseptic douches.

CASE VI.—X., 27 years of age, married, had borne five sickly children. She suffered from menorrhagia and pelvic pain, and was found to have chronic inflammation of the uterus and its appendages. Being unwilling for any radical operation, she underwent dilatation and curetment, and had long-continued treatment of a palliative kind. This made, however, little change in her condition, and she submitted to an abdominal operation. One tube, which was greatly thickened and occluded, and a large diseased ovary were removed. The other appendages showing no marked signs of disease were left, the cysts in the ovary being punctured. Just one year later I had to remove these appendages, which were found to be in a similar condition to those first removed. The patient still at times has metrorrhagia, owing to fresh attacks of uterine infection. Her general health has been improved.

Numerous instances similar to these just cited might be given, but I shall ask your indulgence but for two more, which illustrate the unsatisfactory nature of operations done by vaginal incision and drainage for the evacuation of pus from tubes and ovaries.

CASE VII.—H. M., 38 years of age, married, had borne two children and had one miscarriage. She had suffered from much pelvic distress and irregularity of the menstrual function, for some time. Three weeks before coming to me for examination she had felt a lump in her left side, in the lower part of the abdomen. On examining her, I found an abscess had opened and was discharging through the vaginal vault. I dilated this opening and carried in a drainage tube which was repeatedly cleansed and replaced until the discharge seemed to cease. The patient returned to her home. A month later she came to me with a mass on the right side of the pelvis. Feeling that a much more thorough operation could be done by the abdominal route, I made an exploratory incision, only to find intestines, omentum, and pelvic organs in a conglomerate mass, matted together by adhesions so dense that any attempt to separate them involved great risk to the patient. I, therefore, closed the abdomen and resorted to vaginal incision and drainage, evacuating a large quantity of pus. The case was a tedious one. Its convalescence necessitated long continued drainage, and, in discharging

the patient, I felt that in all probability the disease would soon recur.

CASE VIII.—B. M., aged 21, single, was a prostitute, who was suffering with acute gonorrhea, when she came under my care. Apart from the vulvo-vaginal and urethral symptoms, which were of an aggravated character, she had a fluctuating tumor filling the lower part of the abdomen to within three-fingers' breadth of the umbilicus and crowding the uterus to the left side of the pelvis. The patient was suffering from marked symptoms of general sepsis. An exploratory abdominal incision was made, as soon as the vulva and vagina were in somewhat better condition. A condition of dense adhesions due to general peritoneal involvement was found in this, as in the last case. Any attempt to separate adhesions to the intestines produced a strong fecal odor and necessitated bowel stitching. The pa-

tient was in no condition for a prolonged operation. The abdomen was, therefore, closed, and the large abscess in the right broad ligament was opened up, *per vaginam*, and drained for many weeks. The pus from this abscess, as well as that from the metastatic abscesses which formed in other parts of the body, was found to contain gonococci in abundance. A cardiac bruit developed and the pulse rate ranged between 120 and 140 for weeks. The temperature was that of a septic fever. I think I have never seen so ill a patient recover. She is still subject, I feel, to a recurrence of her trouble, as it cannot be possible that the virus of the disease has been entirely destroyed.

I am indebted to the pathologist and bacteriologist of the Woman's Hospital for the examination of the morbid specimens in these cases.

## DISCUSSION.

DR. C. P. NOBLE said the experience of all dealing with the diseases of women shows gonorrhea to be one of their most serious maladies. The cases recorded by Dr. Fullerton are of a type seen daily.

The treatment of acute gonorrhea and especially of gonorrheal endometritis by curettage and cauterization referred to by Dr. Fullerton has never been employed by Dr. Noble. He agrees that since it is impossible to disinfect the vagina, *i. e.*, to kill by any single application all the vaginal gonococci of a patient having gonorrheal endometritis, it seems to him illogical to attempt to disinfect the endometrium. From this he would expect, as a result, septic trouble to travel to the tubes. The best method of treating gonorrhea is rest in bed, cleansing of the vagina, the use of silver nitrate, and later of astringent douches and repeated applications of silver nitrate. This method of treatment will not be injurious to the patient. Gynecologists have cured the uterus many times for subacute gonorrheal endometritis. Dr. Noble supposes he has done so at least two thousand times. Excepting in two or three cases complicated by diseased appendages and in which reaction was expected, he has never seen a rise of temperature after cureting and irrigation.

Therefore he does not fear irrigation. Those who fear to employ it either are restrained by theoretic objections or they must irrigate very violently.

In operating for bilateral disease of the uterine appendages from gonorrheal infection, either a salpingo-oophorectomy may be performed or the uterus may be removed along with the tubes and ovaries. An experience that has included both methods has taught Dr. Noble that the complete is the more satisfactory operation. He, however, does not believe that all the uteri which are left in will give rise to a great deal of trouble from gonorrheal endometritis. In his experience this sequel is infrequent. In operating for all trouble of the uterine appendages the present tendency among careful men is not to operate so early as formerly; not that one should wait till the patient's general condition becomes bad, but that if the general condition does not demand operation there is a tendency to wait until the acute attack subsides. Much better results are thus obtained than by prompt operation after an acute attack of pelvic peritonitis, when the bowels are adherent, and the adhesions are so tough that the bowel is apt to be wounded in breaking them up. These are also more general than if time is allowed for the

absorption of the exudate and the restoration of the peritoneal cavity to as nearly a normal point as possible. These facts are borne out by Dr. Noble's experience.

As to the question of drainage versus exsection: in gonorrheal cases he thinks the employment of drainage should be limited to large abscesses and to patients broken in health. In this limited class of cases a radical exsection operation would be dangerous. The number of drainage operations seen by Dr. Noble has been comparatively small. They, however, enabled the patients to recover in good condition and in a certain number of cases effected a practical cure. Drainage into the vagina, though a valuable expedient in desperate cases when there is a large amount of pus, is inefficient where the pus tubes are small.

DR. LEVI J. HAMMOND cited a case, in illustration of the dangers of endometritis, due to gonorrheal infection, and also of the advantages offered such cases by the vaginal method of drainage. A prostitute, who contracted gonorrhea, was first seen by Dr. Hammond, three weeks after its onset. The uterus and vagina showed all the symptoms of acute infection. He curetted, and, two days later she had a most violent pelvic inflammation, which was treated in the routine manner, and later a large accumulation of pus developed on the right side. He punctured through the vagina, and liberated a large quantity of pus. She made an uninterrupted recovery.

DR. RICHARD C. NORRIS expressed the belief that gynecologists were now in a transition stage in their attitude toward conservative surgery of the appendages. As the years have gone by, study of the cases of women from whom the ovaries and tubes have been removed, has convinced every operator that many of these women are wretched, and the question of conservative surgery demands careful consideration. From his experience, he first cited the case of a young girl, for whom he tried to save a part of an ovary, and was obliged within six months to reoperate and remove a cyst the size of an orange. This disgusted him with conservative treatment, but he involuntarily, yet successfully, practised it on another case, in which he operated and found the pelvic organs in an entangled mass. His surgical judgment dictated a hysterectomy, but this was out of the question on account

of an absolute promise that both ovaries should not be removed. One tube and ovary were sacrificed, and a portion of the other tube and ovary were resected. In a few months the patient was absolutely cured of all her symptoms; she has no pelvic pain, her uterus occupies its normal position, she is in excellent health, and menstruates without pain. There are many cases analogous to these two. There are no fixed rules or well-defined principles to guide one in conservative surgery of the appendages. The patient's age, her social condition, the number of her children, her willingness to undergo a second operation if an attempt at conservation fails, may warrant the attempt. We cannot, even after operation, predict success or failure, since each may occur when least expected. The subject is yet in an experimental stage. In the treatment of long-standing pelvic suppuration there is again conflicting experience. Those men who claim the advantage of drainage thoroughly appreciate its plan. This is not simply an incision and insertion of a drainage tube. It is a thorough opening, the pus sacs are torn open, separated and packed with gauze and there is a wide open door for drainage. Any other form of drainage is not to be considered. For some cases the abdominal route is to be preferred. To illustrate the difficulty of selecting the proper operation for the individual case two instances occurring in Dr. Norris' practice in the past month were cited. They were both cases of large pelvic abscesses in women of about the same age and history. One had the diagnosis of appendicitis made by a capable man before being seen by Dr. Norris. He found the abdominal and pelvic conditions that warranted this complication and in consequence was fearful of attacking the case by the vagina. Had he known that the appendix was not involved he would have performed the vaginal operation, for the woman was in a desperate condition. The abdomen was opened, widespread adhesions and a desperate pelvic condition were found which could not have been reached by vaginal drainage, and which, once attacked through the abdomen, could not be relinquished. The patient, exhausted by long suffering, died. The other case operated upon through the abdomen, had thorough drainage, the tubes, ovaries, and uterus were removed, and uncomplicated recovery resulted. Cases met

in actual practice are of such doubtful character that one cannot always determine which route is best. If a hard and fast rule is to be followed, Dr. Norris favors operation through the abdomen. Operation by the vagina must establish *thorough* drainage, which is much more than a puncture of the vaginal vault and the introduction of a drainage-tube, and which, even when properly performed, will not always effect a cure of the pelvic lesions.

DR. GEORGE I. MCKELWAY said that in the Philadelphia Hospital many patients were met who had large collections of pus in the abdomen and pelvis, and who were profoundly and septicely intoxicated. Their condition usually results from septic criminal abortion. Formerly they were operated upon through the abdomen and many died. Now some of the surgeons in attendance have learned the free incision through the vaginal floor. This permits evacuation and drainage and gives better results. He does not consider it a final, but a tentative operation, the purpose of which is to tide the patient over a desperate condition. When this is accomplished a formal abdominal section usually follows for the removal of diseased tubes, ovaries, and uterus, according as is indicated. This operation (vaginal incision) is condemned only by those having no experience with it or who have done it faultily. A case operated upon by a surgeon who says he never performed this operation but once and never will again, came under Dr. McKelway's care in the Philadelphia Hospital.

A puncture on a level with the cervix had been made with a trocar and canula. The puncture was on so high a level that the sac was not emptied. For weeks it had been partially emptying and refilling, and the woman's general condition was deplorable. Dr. McKelway made a large incision in the posterior vaginal cul-de sac, broke up everything he could, washed out the cavity with hydrogen dioxid solution and packed it with iodoform gauze, but the woman's whole system was poisoned and she was too far gone to recover. In concluding he emphasized his belief that in the majority of cases the vaginal incision is not the ultimate operation, but simply a tentative one that must be followed by abdominal section to complete the cure.

DR. GEORGE E. SHOEMAKER's experience

coincided generally with what had been said. He deprecated the operative treatment of acute gonorrhea in cases whose condition did not absolutely demand it from danger to life. Cureting does not commend itself. Abdominal section for destructive gonorrheal inflammation of tubes is best deferred until nature has made her strongest effort to repair the damage. The cases best suited for conservation of the ovary are the non-inflammatory cases which are found in connection with growths of the uterus. Gonorrheal cases, in which there are extensive adhesions and destructive processes, are not generally cases for conservative treatment.

DR. C. P. NOBLE agreed with Dr. Norris, that if vaginal drainage is to be established, a large hole must be made. He always incises the vagina with a knife and enlarges the incision by inserting scissors and spreading their blades, so that at least two fingers will enter the abscess sac. The less that is done after this the better. He packs a pelvic abscess lightly, and never repacks it. He never employs a drainage-tube, and so far has never seen a case that did not close up nicely; and so prefers this treatment to that of repeated packings, or of the use of a drainage-tube. Either of these methods are frequently followed by sinuses.

In deciding the question of ovariectomy, Dr. Noble thinks his errors of omission have been greater than those of commission. Among poor people he finds the results from the conservation of ovaries and tubes is very satisfactory. He has tried it in many cases, and has resected tubes and ovaries for gonorrheal or puerperal infection. This class of cases, in his experience, has been very satisfactory. Nor has that referred to by Dr. Shoemaker given bad results. In young women desirous of having children, tubes and ovaries can be left, if the patient is willing to take the chances of a secondary operation. At this stage of surgery it is the surgeon's business to leave them in. Dr. Noble does so, and frequently the patient is disappointed and has to have a secondary operation done.

DR. S. SOLIS-COHEN said that while he had no experience with the treatment of gonorrhea in the female he had had some experience with the diagnosis of the results. One subject alluded to by Dr. Fullerton and by a number of the speakers had been of

great interest, namely, the liability of confounding inflammation of the tube and ovary with appendicitis. He had made this mistake and learned to try to avoid it. He had sometimes been called in consultation where the mistake had been made by those who ought to have known better than he how to avoid it. However, the two conditions are often associated. Whether or not the diagnosis is finally made, when appendicitis is suspected in addition to the other condition, it seemed to him that if operation was to be done, it were better done abdominally, because then all lies before the operator. He has seen cases, indicating that the combined condition may be originated in both ways; that is to say, a slumbering appendix may be awakened by the pus-tube or a slumbering pus-tube may be awakened by the appendix.

DR. FULLERTON, in closing the discussion, said that her object in presenting her paper was to obtain some light on the treatment of this troublesome condition. When the disease affects the interior of the uterus, the tubes, and the ovaries, it is in such an inaccessible site that it is practically incurable. Dr. Fullerton feels that the tendency has been to operate too frequently for conditions perhaps best let alone; or, at least, not treated by operative procedure. There are conditions such as those in which large pus-tubes or extensive adhesions exist, which necessitate operation, and then a very radical one seems most desirable. The best results are always obtained when one does not operate too soon after a recent attack, but waits until the inflammation subsides, unless there is necessity for immediate operation on account of the patient's condition.



## AMYOTROPHIC LATERAL SCLEROSIS—REPORT OF A CASE.

BY A. FERREE WITMER, M.D.

Read October 12, 1898.

THE man whom I present this evening is an American of German parentage, forty-five years of age, of temperate habits, a machinist by occupation. For twenty-five years prior to the onset of his affection he worked steadily at his trade, frequently as long as fifteen hours daily for months at a time. His work required the almost constant use of a lathe, by which he trimmed the iron work in an engine yard. He has been married for ten years, but has had no children. His wife has twice miscarried.

The only neurotic inheritance that could be ascertained is the death in early life of two maternal aunts from asthma.

The personal history, aside from an attack of typhoid fever seven years ago, is negative. The patient was in good health until December, 1896, when he noticed a weakness of the muscles in the left hand. This was particularly marked when he attempted the finer movements of the fingers. About one month later, wasting was noted in the interossei muscles and thenar eminence of this hand. The atrophy spread rapidly and in six months the entire left arm became powerless. The paresis first attacked the hand, then the upper arm, then the forearm and finally the shoulder girdle. Fibrillary twitchings were also noticed in the interossei muscles about one month after the wasting began. Five months after the onset of wasting in the left arm the right became similarly affected, but the degree of atrophy never became so great as it is in the left. In June, 1897, the left arm and left hand became entirely denuded of hair; this later grew again and is now equal in quantity to that on the right. The bladder and rectum have at all times been under control; but for nine years the sexual function has been weak. The lower limbs have thus far entirely escaped; the patient

not infrequently walks six to eight miles daily without fatigue. He further states that his eyelids have constantly felt droopy for the past nine months. For a period of two weeks, about three months ago, he complained of daily suffocative attacks which recurred regularly at about three o'clock in the morning. The special senses and general sensibility have never been impaired.

Examination shows a man of large frame and spare habit; the expression of the face is masked, but intelligence is in full vigor; the tongue and lips are slightly tremulous and to a lesser degree the muscles of the entire face are the seat of a tremor such as is commonly seen in paralytic dementia; the voice is of lowered pitch, but the speech is normal. Wasting of the upper limbs is far advanced; the left arm is powerless, the right he can still use with effort. No incoordinate movements of the limbs are seen, but there is noted a rhythmical contraction in the right arm recurring about ten times per minute. This is quite distinct from the fibrillary tremor occasionally seen in the individual muscles of the hand. The muscles of the shoulder girdle are atrophied on both sides, but the chest and back muscles are apparently not affected.

The vegetative organs are normal. The electrical examination shows slowed response to the galvanic current in the left upper limb; in the right upper limb the response is normal. To faradism with the slowly interrupted current no response is obtainable in the left upper limb; with the rapidly interrupted current a slight contraction is noted excepting at the base of the thumb; in the right upper limb the response to the faradic current is normal. The gait and station are normal, the knee kicks are exaggerated; ankle clonus is present on both

sides; the elbow jerks are present, but the right is more marked; the wrist jerks are not marked; the jaw jerk is prompt.

The affection known as amyotrophic lateral sclerosis, or Charcot's disease, is exceedingly rare. The writer has been able to find but eleven cases reported by American writers. Of these, one is by Aiken,<sup>1</sup> two by Brown,<sup>2</sup> two by Collins,<sup>3</sup> one by Esterley,<sup>4</sup> one by Halbert,<sup>5</sup> one by Krauss,<sup>6</sup> one by MacIntosh,<sup>7</sup> one by Shaw,<sup>8</sup> and one by Robinson.<sup>9</sup>

The cause for this affection is obscure. The time of onset is usually during the third decade of life. The case reported by Krauss began in the patient's sixty-eighth year, while two cases reported by Brown were brothers, and both were under twenty years of age. The occurrence of two cases in one family led Brown to suggest the possibility of an infantile family sclerosis. The comparatively frequent occurrence of this affection in those using the hands to excess, is very significant. Thus, of the twelve American cases, including that of the writer, one was a weaver, another a sailor, a third was a pianomaker, a fourth a tailor, a fifth a gold-beater, a sixth a telegraph operator, and a seventh a last worker. In one case the occupation was not stated. Mills, in a recent paper on the "Reclassification of Some Organic Nervous Diseases on the Basis of the Neuron,"<sup>10</sup> places this affection among the acquired neuronal degenerations of the motor type.

Males are more frequently attacked than females.

Trauma as a cause must be considered. Goldberg<sup>11</sup> has recently reported such a case. The attack of typhoid fever seven years before the onset of the weakness, may have been a strong predisposing factor. The patient also states that he never felt right since that time. In this connection it may be of interest to recall that Cerné has reported a case of typhoid treatment by muscular hypertrophy and trophic disturbance of the skin.<sup>12</sup>

The consensus of opinion on the morbid anatomy would indicate a primary lesion of the pyramidal tracts, with a secondary involvement of the gray matter.

The symptoms in the writer's case are in the order of their occurrence, paresis, wasting, and tremor or spasm. The paresis, as you noticed, is not of the spastic but of the

flaccid type, thus following the description of the affection as reported by Leyden rather than that of Charcot. The wasting of the upper limbs has not progressed to the degree known as claw-hand, but, owing to the marked enfeeblement of the thumb, the simian characters are clearly defined.

The writer regards this condition not as incidental, but in the nature of an actual involutionary change.

An unusual feature, if not, indeed, unique, is the loss of hair that at one time occurred on the more affected limb.

Trophic disturbances in amyotrophic lateral sclerosis are not considered possible. Bruns and Windscheid<sup>13</sup> are particularly pronounced on this point. The possible use of a depilatory was asked but denied.

The recurrence of the suffocative attacks daily for about two weeks, near 3 o'clock in the morning—the time when the resistance of the nervous system is at its lowest ebb—is significant of the further spread of the disease. Dr. Freeman, however, who kindly examined the case, confirmed the diagnosis of acute rhinopharyngitis. For two months the patient has had no recurrence of the suffocation. The lack of involvement of the lower limbs and the probable involvement of the sexual activities are both unusual.

A differential diagnosis between this and allied affections is not always practicable.

Progressive muscular atrophy, progressive muscular dystrophy, syringomyelia, chronic myelitis, multiple sclerosis, pachymeningitis cervicalis hypertrophica, peripheral polyneuritis, and bulbar affection of the oblongata, have all features in common with this affection.

By some authors, notably Dana,<sup>14</sup> amyotrophic lateral sclerosis is considered as a special form of progressive muscular atrophy.

In a personal communication to the writer Fisher states his "belief that amyotrophic lateral sclerosis is not a disease differing from progressive muscular atrophy, but rather similar in character, involving larger areas of the cord."

The exaggeration of the deep reflexes would serve to separate amyotrophic lateral sclerosis from progressive muscular atrophy.

In progressive muscular dystrophy there is usually a history of heredity; the disease occurs earlier in life, the lower limbs are

more frequently affected, and the course of the disease is more protracted. In syringomyelia there are characteristic disturbances of subjective and objective sensibility.

Disturbances of the bladder and rectum would distinguish chronic myelitis from amyotrophic lateral sclerosis.

In multiple sclerosis we find scanning speech, intention tremor and atrophy of the optic nerve.

Pachymeningitis cervicalis hypertrophica runs a more rapid course, and pain and disturbances of sensibility are also present. The wasting of the hand is characteristic and causes an appearance that has been called the preacher's hand.

Polyneuritis shows disturbances of sensibility with no increase in the tendon reflexes.

The bulbar affection of the cord, such as hemorrhage or softening, closely simulate the bulbar form of amyotrophic lateral sclerosis, but the atrophy of the hands at once distinguishes the more usual spinal form of amyotrophic lateral sclerosis.

The prognosis is necessarily grave; the

duration of the disease is from two to six years.

Much can be done, however, to stay the progress of the disease. The improvement recently attained in chronic organic spinal affections, such as tabes dorsalis, multiple sclerosis and paralysis agitans, indicate the possibilities in other chronic spinal affections of an organic nature. The patient has been under observation for nearly a year. Within that period there has been no increase in the degenerate progress as shown by the symptoms. The treatment that has been found useful in this case is galvanism and strychnin.

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#### DISCUSSION.

DR. F. SAVARY PEARCE agreed with Dr. Witmer that overwork of the extremities may have been a determining causative factor in this case. Overuse of the arms in a person predisposed to nervous disease, either naturally or acquired because of enfeebled health, would have a reactionary effect upon the weakened central neurons as well as of the peripheral ones, and there would result what might be properly called a terminal occupation-neurosis from extreme overuse of these cells—degeneration resulting.

A state of toxemia might also be a cause, acting coincidentally with that of overwork at the time of the development of the disease; this might originate from ptomaines, or from the leucomains developed in the body, as from uric acid or other poisons circulating in the blood.

The treatment in this case, and in others of like condition, should be kept up persist-

ently. It is a mistake to think nothing can be done because a case is one of chronic degenerative nervous disease. Some patients have been very much improved by treatment, especially by scientifically given massage and electricity.

Accepting Dr. Mills' anatomic classification according to the neuron theory, Dr. Pearce thought it a logical possibility for this degeneration to ascend to the cortex of the brain or to coexist there, and he inquired whether Dr. Witmer's patient had deteriorated mentally.

DR. WITMER replied that he did not think that his patient's bulk had yet been affected to any marked extent. No change in the mental condition had been detected in a year's time. The patient would be able to work as before, were it not for his muscle-loss.

## REPORT OF INTERESTING CASES OF ABDOMINAL SURGERY, WITH REMARKS.

BY MORDECAI PRICE, M.D.

Read October 26, 1898.

THE case to which I will first call attention is of interest because although a number of good men had carefully examined it the diagnosis was not made. The case was in many ways most unusual, its like never before occurred in my professional experience, nor do I know of a report of one similar to it.

### ABSCESS OF LIVER; GALL-STONES.

Mrs. S., a patient of Dr. Baker, and living near Harrisburg, Pennsylvania, had suffered for over a year from what she supposed to be dyspeptic cramps accompanied by sick stomach. She had no symptoms pointing either to the liver or the gall-bladder as the cause of her suffering. Dr. Baker's attention was at this time called to a tumor in the region of the right kidney. The tumor extended down to the rim of the pelvis on the right side, it was movable in every direction, but imparted to the examiner's fingers a distinct feeling of an attachment in or near the region of the right kidney. Many conjectures as to just what the tumor was were expressed. None of these came near the actual conditions. There was no mention of abscess of the liver, nor was there any expressed suspicion that the gall-bladder was involved. She was placed in my hands by Dr. Baker for operation. An incision two and a half inches long was made over that portion of the tumor which would most facilitate the operator in reaching the pedicle. I considered it best not to make the opening too large until I had fully investigated with my finger the abdominal cavity. I found the right kidney normal and in its right position, the gall bladder was empty, and a large projecting tumor of the liver

extended down to the brim of the pelvis. This mass was freely movable, and fluctuated on deep pressure. A small hypodermic syringe was used to settle the question of pus. Pus was found, the liver capsule was stitched to the abdominal wall, and the liver was freely incised for at least an inch and a half. Had the abscess been a fraction of an inch deeper the needle would not have reached the abscess cavity. In examinations of this character, the needle should be a small one and a long one. Many ounces of pus were washed out, the cavity was explored by the fingers and twenty four gall-stones removed—many of them were as large as the first joint of my thumb; there was quite a thickness of liver-tissue surrounding the abscess cavity. The thinnest point was under the gall-bladder. The only explanation for the presence of the gall-stones in the abscess cavity is that ulceration took place in an over-distended gall-bladder, that the ulceration produced an abscess of the liver, and that as the abscess enlarged the stones were forced from the gall-bladder into the liver. Gauze drainage was used in this case and it was stained with bile. The patient was some five weeks in the hospital and made a beautiful recovery.

### PORRO OPERATION AT TERM.

Mrs. S., patient of Dr. William Burns, Philadelphia.

Mrs. S. was 33 years old, and was married three years before she became pregnant. She was exceedingly anxious about her approaching labor; one of her sisters having died in labor undelivered. She fell in labor on July 29, 1898. Dr. Burns was not called until the morning of the 30th. Upon

examination he found her in labor complicated by a large fibroid in the birth-canal. He could not find the cervix, but the toes of the child protruded under the pubic bone. I was asked to see her in consultation. It was immediately decided to operate, and to do a Porro operation, which was done in the afternoon. This delay was due to the fact that the husband wished his old family physician, Dr. George H. Kobler, to examine her and see if he could not deliver her without operation. He did examine her and agreed with us as to propriety of the operation. Dr. William Burns, Dr. Marshall Hinkle and Dr. George H. Kobler assisted in the operation. She made an uninterrupted recovery. Both mother and child are, at the date of this report, doing well. This is the third Porro operation I have done. All the mothers are living and two of the children. I have also assisted my brother, Dr. Joseph Price, in five Porro operations, all the mothers and three children living. All the children lost were dead before the operation. When we remember that all these cases were hopeless without operation—and that even with it, many of them were desperate because of long and tedious labors, I regard this as a good showing. The Porro operation is indicated in all labors in which there is either a marked deformity of the pelvis or in which the womb suffers from fibroid disease of sufficient extent to render labor impossible.

#### AN INTERESTING CASE OF VENTRAL FIXATION.

This patient had been operated on at the Pennsylvania Hospital in the autumn of 1897. She had complained considerably, prior to the operation, but her suffering was very much greater after the operation. She had been pregnant before she came under my care, but just at what time her pregnancy began it was impossible to determine, as the child was lost before she came into the hospital. I should judge from the size of the retained placenta that she had miscarried at about the fifth month. She spent two or three weeks in St. Joseph's Hospital, where

she was told that she was pregnant. After leaving St. Joseph's Hospital I was asked to see her. Her suffering was then so great that I thought an operation was demanded. The tumor extended on both the left and right sides as far as it could go, and had a deep sulcus extending from the umbilicus to the diaphragm. The tumor was hard and felt like a myoma. She was admitted into Dr. Joseph Price's Hospital, and with my assistance Dr. George M. Hughes operated on her. At the time I was so weak from typhoid fever that I did not regard it as safe to do the work myself. Dr. Hughes made a four-inch incision and a most careful inspection of the tumor. A broad band was found to pass from just above the pubic arch over and to the back of the tumor, dividing it into two equal segments. This band was cut through with the scissors, and the tumor, which was the womb, immediately assumed a spherical form and its natural position. The two ends of the ventral fixation now became separated by twelve inches. The fundus of the uterus was where the cervix ought to be, and the cervix was pulled out of the pelvis. Evidently at the time of the miscarriage, or the partial miscarriage, the fundus had blocked the cervical outlet, so that the hemorrhage and placenta were retained. After the band was cut loose and the uterus assumed its natural position, it was then impossible to say whether it was an edematous myoma or a pregnancy, for no child could be felt and there had been, up to this time, no history of a miscarriage. From the fact that she had been operated on so recently at the Pennsylvania Hospital for ventral fixation, we deemed it impossible for her to be suffering from myoma. There being well-marked inflammatory indications throughout the peritoneal cavity, thorough irrigation without drainage was used. The patient miscarried on the following day of a large placenta, and black grumous clots, nearly a chamberful. Vaginal irrigations were used daily. She was very septic and for many days it was thought she could not live. When she began to mend she did so rapidly and went home perfectly well.

## DISCUSSION.

DR. SHOEMAKER said the last case confirmed him in his long held opinion that ventro-fixation, in the literal acceptance of that word, is a mistake, and particularly it is so in child-bearing women. The technic which in any case involves the attachment of the posterior part of the uterus to the abdominal wall is faulty, because if pregnancy supervenes the fundus will be incarcerated. In cases where, as an accessory to some other operation, an attachment of the uterus is made to the abdominal wall, it is justifiable.

Attachment should be made, in child-bearing women, in front of the line of the tubes, and it should always be so slight that it can never be considered in any sense as producing a fixation of the uterus. In Dr. Shoemaker's experience all of the complications in pregnancy that have followed this operation, have been due to strong attachment of the uterus behind the lines of the tubes. Although it should never do so, occasionally suppuration follows an abdominal section. In this case there was a *fixation* of the uterus. In aseptic cases the abdomen should only be involved to the extent of the peritoneum and a few muscular fibers. In such cases incarceration cannot occur.

DR. GEORGE I. MCKELWAY congratulated Dr. Price on the results of the cases that he presented. The abscess of the liver suggested the case of a woman who exhibited typical symptoms of an acute attack of appendicitis. She was seen by Dr. McKelway nine weeks after the sudden onset of appendiceal symptoms. There was a mass which was some two inches in diameter, and extended well down into her pelvis, in the position usually occupied by an inflamed adherent appendix. When about to operate on this woman, at the request of Dr. McKelway, Dr. Deaver said: "This may be a gall-bladder-case," and so the incision proved. The gall bladder was found adherent to the intestines and omentum clear down in the pelvis; it was elongated, enlarged, and contained half a pint of pus and two gall stones, each larger than the last joint of the thumb. The walls of the duct were entirely obliterated and the walls of the gall-bladder were calcified, and peeled off as does old plaster from a wall. The whole mass was removed,

and the woman, who was 67 years old, died about 27 hours after the operation.

The interesting case of Porro operation suggested to Dr. McKelway that there was a rival method, that of complete extirpation; which is the best procedure, will be a question for discussion probably for years. He cited a case at the Methodist Hospital, not that of a pregnant, but of a large fibroid uterus, that he removed *in toto*. The woman made a perfect recovery without serious discomfort or any complication, and returned to her home in another city in four weeks. He prefers a complete extirpation, which leaves no mass to be gotten rid of by a putrefaction, which possibly is clean, but yet is putrefaction.

He emphasized Dr. Shoemaker's statement that in a vaginal fixation of the uterus the attachment should be very light, and he believes that, if suppuration occurs and the operation has been done in a child-bearing woman, it is wise to free the uterus by a second operation before the womb can become pregnant. When the operation is properly done and the wound heals aseptically, no complication need be looked for at pregnancy. Suppuration in the wound, however, invites disaster. He does not see the advantage of a ventro-fixation over Alexander's operation. If the uterus is fixed and the abdomen is opened and the uterus freed, then either Alexander's operation or shortening the round ligaments within the pelvis should accomplish the same thing without difficulty or danger during pregnancy. The objection to Alexander's operation is that it cannot be done in cases of fixed uteri, but if abdominal section is made and the uterus freed from its adhesions, why should not Alexander's operation follow as the operation of preference rather than ventro fixation, in which there are dangerous possibilities.

DR. ROBERT LE CONTE inquired if Dr. Price knew by what method the ventro-fixation which he had severed had been performed. Was it by a buried silk suture, and if so, did the suture include the fascia or simply the muscle and peritoneum?

DR. M. PRICE replied that he did not know how the fixation had been made, but it was plain that the posterior face of the

uterus had been brought forward, doubled over the bladder, and fastened to the abdominal wall. The pedicle was as broad as two fingers, and only three inches long. The operation was either very thoroughly done, or, as suggested by Dr. Shoemaker, a very serious inflammatory condition followed the operation and produced the strong adhesions which were found. Dr. Price not only affirmed the words of Dr. Shoemaker and Dr. McKelway concerning ventro fixation, but he added that he had never seen a case of displaced uterus which could not be cured or made very comfortable without use of the so-called abdominal methods of tying up and fastening the uterus. Ventral fixation has only been a source of trouble and danger to the patient even when the operator has accomplished his object. If the uterus were held forward in its proper position then good might be done, but Dr. Price has found in all abdominal operations upon patients who have undergone ventro-fixation that there was invariably subsequent trouble where bands were present, and that when there were no bands or adhesions, there was no support at all. Alexander's operation he strongly condemns, and urges that it is not the function of the round ligament to afford support to the womb. He has never seen a round ligament taut, although he has seen hundreds of them in his own operations. He has never seen a round ligament support anything in the abdominal cavity. On the contrary, he has seen it curled up at the cornua of the uterus, and its adhesion to the abdominal wall and through the ring has been simply a matter of loose anatomical arrangement. The one object of the Porro or any operation, especially in the abdomen, is to save life. The purpose of the Porro operation is to save two lives, particularly the mother's. In Dr. Price's experience, the Porro operation is never followed by a rise in temperature of one degree. The mother endures no subsequent suffering, and the child nurses as comfortably as if it had been born in the natural way. Odor and sloughing about the stump are absent, and this has been noted even in a case that was not touched for eight or nine days after the operation. Contrasting eight cases with a similar number of the Cesarean operation, performed by the best men in the world, the Cesarean mortality is high, while that of the Porro operation, even in unskilled hands, is good. In the fibroid con-

ditions of the uterus the Cesarean operation is never safe, but the Porro operation is recommended by all who have performed it. It removes not only the pregnancy, but any uterine fibroid disease that may be present, and of course renders it impossible for either of these conditions to occur in the future. It removes all dirt from the peritoneal cavity. There need not be a drop of blood or amniotic fluid allowed to escape into the abdomen. An intestine need never be seen if the operator uses a couple of gauze towels scalded and washed out at the time of operation. When the abdominal incision is made a hand should be slipped around the tumor or the uterus to deliver it and hold the nœud. The uterus is then opened, the amniotic fluid let out, and the child is delivered. In ten or fifteen minutes the operation and dressings should be completed. Free hemorrhage does not occur. There is no subsequent fear of pregnancy. Eight living women attest the value of the operation. Two of their husbands, speaking of their wives, have recently said, "She has never had a sick day since the operation, and never had a well one before." The last case, that operated on for Dr. Burns, had never been well since she was 21. The Porro operation removed the obstruction in the vagina. The occlusion was complete, the tumor protruding at the external vaginal outlet. When should the Cesarean operation be done? When a child, because of its size, cannot be delivered from the normal pelvis of a young woman, who can unquestionably be delivered of an average-sized child. In such an instance the Cesarean operation is justified. But the occasions are rare. In this city there are probably not more than half a dozen women who have normally-sized pelves, and who cannot be delivered because of the abnormal bulk of their children.

Total extirpation does mischief that the pedicle in the abdominal wall never does. The total operation removes the whole uterine support. It shortens the vagina and takes away at least half of its roof. Complete extirpation for cancer is followed by hernia of the bowels, which push down the vagina. If a case is complicated by cancer, it is our duty to do this operation by compulsion; it is not an operation of choice, but the last to be selected. The nœud operation for hysterectomy can be done in 99 cases out of

100. That the abdominal wall is weakened by an abdominal fixation of the pedicle in hysterectomies, or Porro operations, he admits. He would combat this tendency by keeping these cases in bed until the abdominal wall is secure. He cautions women who have been operated on not to do athletic work that requires great strain on the ab-

dominal muscles, and although he is an abdominal surgeon, he sees more herniæ result from simple muscular strain or natural weakness of the abdominal wall, than as a sequence to operation. The Porro operation is a means of saving life; no other operation promises any more than it, if as much.



## A REPORT OF FIVE CASES OF DIPHTHERIA.

BY JOHN M. SWAN, M.D.

Read November 9, 1898.

THE group of cases here reported seems to be interesting for three reasons: on account of the age of two of the patients, on account of the absence of false membrane from the throats of all the patients, and on account of the good results of the treatment.

The family, C., consisted of father, mother and six children: Bella, Mary, Maggie, Rebecca, William, and Howard. Early in September, the father, aged 29 years, and Mary, aged 4 years, had diphtheria, and were treated by another physician with good immediate results. The cases were reported clear bacteriologically on the 15th of September, and the house was fumigated. After this Mary became dropsical and, on the night of September 17th, died suddenly. On Sunday, September 18th, Rebecca, aged 2 years, was taken ill, and I was sent for. The patient complained of sore throat, swelling of the left tonsil so that it could be felt externally, and slight fever. On examination the patient appeared drowsy, the temperature was  $101.6^{\circ}$ , the pulse was 120 per minute, and there was a well-marked, grayish discharge from the nose. The throat was red, the left tonsil was swollen, but there was no false membrane. An inoculation of a blood-serum tube was made and sent to the Bacteriological Laboratory of the Board of Health. The report received stated that the culture contained diphtheria bacilli and was, therefore, a case of true diphtheria. I was not satisfied with this report, although I knew well that the diphtheria bacillus might be present in a given throat even if false membrane was not present. I went to the laboratory and explained my grievance to Dr. Abbott. He showed me the cover-glass preparation of the growth from the inoculated tube. There was no doubt whatever that the throat contained

the bacilli of diphtheria, although, clinically, the case was not one of diphtheria. At Dr. Abbott's suggestion I made inoculations from the throats of the other members of the family, except the father, whom I sent away from the house, since he had already been declared free by bacteriologic examination. Bella, aged 6 years, Maggie, aged 3 years, William, aged 5 months, and Howard, aged 5 months, presented the Klebs-Löffler bacillus. The mother did not present the diphtheria bacillus, although her temperature was  $100^{\circ}$ . At Dr. Abbott's further suggestion I gave the mother 500 antitoxin units of the Board of Health anti-diphtheritic serum for immunity, before the result of the inoculation was known. At the same time Rebecca and Maggie each received 250 units of the same serum. I did not give Bella antitoxin on account of her anemic condition, and on account of her extreme terror. The twins did not receive antitoxin until after the report of the inoculation was received. When this proved positive, each twin was given 500 units of antitoxic serum. These steps occupied the days from September 18th to 24th. The injections of antitoxin produced no unfavorable results in any of the patients to whom it was administered. I subjoin the temperature and pulse record:

Mother, aged 28 years, temperature  $100^{\circ}$ , pulse 66, at the time of the inoculation; in 24 hours, temperature  $100^{\circ}$ , pulse 66; the following day, temperature  $98^{\circ}$ , pulse 66.

Maggie, aged 3 years, temperature  $98.4^{\circ}$ , pulse 128, at the time of the inoculation; in 24 hours, temperature  $98.4^{\circ}$ , pulse 110.

Rebecca, aged 2 years, temperature  $99.2^{\circ}$ , pulse 128, at the time of the inoculation; in 24 hours, temperature  $98.8^{\circ}$ , pulse 128.

William, aged 5 months, temperature  $101^{\circ}$ ,

at the time of the inoculation; in 24 hours, temperature 98°.

Howard, aged 5 months, temperature 99.8° at the time of the inoculation; in 24 hours, temperature 98°.

Dr. Abbott also called my attention to the results of the local use of a strong solution of silver nitrate for the purpose of destroying the Klebs-Löffler bacilli, after the constitutional symptoms had disappeared, as reported by Dr. Hand.<sup>1</sup> I determined to try this procedure after giving the antitoxin, in order, if possible, to have the quarantine removed from the house at the earliest possible moment. Accordingly, on the 24th of September, I applied a solution of silver nitrate (1 dram to the ounce) to the throats of all the children in the family, and on the next day, September 25th, made inoculations from each throat and sent the tubes to the laboratory. As a result of these applications the cultures from William and Maggie were negative, while those from Bella, Rebecca, and Howard still showed the presence of the Klebs-Löffler bacillus. On the night of the 26th of September I applied the silver nitrate solution to the throats of the three children who still showed the presence of bacilli, and made further inoculations of blood-serum tubes. As a result of these applications all the cultures were negative and the house was disinfected on September 28th, exactly ten days from the beginning of my professional relations with the family.

None of the children received other treatment than antitoxin and applications of silver solution except Rebecca, the one who was first taken ill. This child was ordered 1 grain of calomel in divided doses, hydrogen dioxide spray, and 5 grain doses of sodium salicylate every two hours for two days, and then a like dose three times a day

for two days. After the presence of the diphtheria bacilli had been demonstrated, the patient took  $\frac{1}{100}$  grain of (corrosive) mercuric chlorid and 2½ grains of iron pyrophosphate every three hours for two days.

My use of antitoxin may seem fickle, but in a hasty glance at the recent literature, an instance in which babies as young as the twins in this family had received antitoxin could not be found, and I was, consequently, timid about using the serum unless the bacilli were actually present. Behring's original immunizing dose of antitoxin was placed at 60 units, but subsequently he advised giving at least 150 units.<sup>2</sup> I thought it safe—and it so proved—to use 250 units each for the two-year-old child and for the three-year old child, and 500 units for the mother. I later found that a Committee of the American Pediatric Society had recommended the use of 1000 units as a curative dose of antitoxin for children under two years of age.<sup>3</sup> I found this authoritative statement before the report from the inoculations from the throats of the twins was received, and I, therefore, decided to give each child 500 units. The results were decidedly beneficial.

The use of the strong solution of silver nitrate (1 dram to the ounce) gave no more discomfort to the children than ordinary astringent applications, and no unhappy result followed its exhibition.

I am very well satisfied with this mode of treatment of diphtheria, and do not hesitate to say that I shall employ it in the future whenever an occasion presents itself. Of course, in a case in which there is well-marked false membrane, it will be necessary to wait until the antitoxin shall have caused the membrane to exfoliate and the constitutional symptoms to disappear before applying the silver solution.

<sup>1</sup> Alfred Hand: *Philadelphia Medical Journal*, August 27, 1898, p. 432.

<sup>2</sup> Behring: *Deutsche medicinische Wochenschrift*, November 15, 1894. <sup>3</sup> *Archives of Pediatrics*, July, 1896.

## DISCUSSION.

DR. HAND expressed his interest in Dr. Swan's report and said he could appreciate the satisfaction experienced in the use of a 60 grain solution of silver nitrate in freeing a throat from bacilli. According to Dr. A. E. Taylor, Dr. Seiler was the first to use a solution of this strength for the purpose of aborting phlegmonous inflammations of the tonsils. Having seen that, in such a case, it did no harm to the mucous membrane, Dr. Hand tried its antiseptic powers in some cases of diphtheria, in which the germs had persisted for several weeks after the throats had been free from false membrane. In the seventeen cases of diphtheria which he has seen since that time, the bacilli have not survived, at the most, three applications, disappearing in some cases after one painting. The length of time for which the germs may be present in the throat without clinical manifestations varies considerably. Fullerton and Williams (*Lancet*, Oct. 23, 1897) mention a French case in which the cultures were positive for 15 months. Many measures have been used to destroy the bacilli, and J. Fibiger (*Berl. klin. Wochn.*, Aug. 30, 1897), without giving it as a therapeutic hint, mentions clinical observations in which anginas, due to streptococci or staphylococci, seemed to be the final causes of the bacilli's disappearance.

White (*Med. Rec.*, Nov. 3, 1894) reported on the comparative values of hydrogen dioxide, sodium chlorid, and corrosive sublimate, with regard to the effect on the membrane and the life of the bacilli, and

found that the germs disappeared a little earlier under the solutions of bichlorid than with solutions of sodium chlorid, but the risk of poisoning outweighed this advantage. Hydrogen dioxide seemed to prolong their duration.

Dr. Riesman was quoted as authority that a German had experimentally infected wounds with various pathogenic germs, and then applied different antiseptic solutions. The most favorable effects, both as regards cultures from the wounds and the clinical course in the infected animals, was observed from silver nitrate.

Since Dr. Hand's report on this subject last June, he has had an experience somewhat similar to that of Dr. Swan: a clinical case of diphtheria in one of a family of six children. Four of the latter, including an 8-months-old child apparently perfectly well, were found to have bacilli in their throats. Through a misunderstanding, the druggist supplied Dr. Hand with a solution of thirty grains to the ounce. This was painful, and when two applications of it cleared only one throat we resorted to the 60-grain solution, which the children said they liked much better. After two applications of it all the cultures were reported negative.

Dr. Wm. Welch inquired what interval of time elapsed between the application of the silver nitrate and the removal of material for culture.

Dr. Hand, in reply to Dr. Welch's question, said his custom is to wait 24 hours after the painting before taking the culture.

CASES ILLUSTRATING THE BENEFICIAL EFFECT OF PLASTIC OPERATIONS UPON THE FACE FOR THE CURE OF CICATRICIAL AND CONGENITAL DEFORMITIES.

BY JOHN B. ROBERTS, M.D.

Read November 9, 1898.

I HAVE brought three cases before the Society as illustrations of what can be done for remedying the disfigurement which may occur from burns, and to show the importance of reparative surgery when large tumors are removed from the face and head.

CASE I.—This colored woman some years ago fell against a range while having an epileptic fit. She burned the side of her nose, cheek and lips to such an extent that the sloughing left great deformity. The left side of the nose was totally destroyed by the sloughing and the tip of the nose pulled to the left by the contraction of the scar which obliterated the nostril. The upper lip was drawn up and the lower lip pulled downward and everted. The first operative treatment consisted in cutting the nose loose from the cheek on the left side, thereby opening up the left nasal chambers, and turning into the opening, so made, a large flap from the forehead. The pedicle of this flap lay across normal tissue at the top of the nose. After adhesion had taken place below, this bridge made by the base of the flap was cut loose and the stump turned up again upon the forehead to aid in covering the space left by the dissection of the flap.

This operation gave much better appearance to the nose, but the nostril which I made then has now become almost closed by cicatricial contraction. This could probably be remedied if the woman cared to submit to further operation. The lips were greatly improved by plastic operations made by means of V-shaped incisions similar to those used in correcting eversion of the eyelids.

CASE II.—This white woman, an epileptic,

also fell against a stove and burned the left side of her face so that the eyelids and globe, a portion of the ala of the nose, and the upper and lower lip on the left side were largely destroyed. I have operated upon her some fourteen or fifteen times in order to repair the deformity caused by the sloughing. An upper eyelid was made by taking a flap from the forehead, including a portion of the hairs of the eyebrow. These hairs serve as eyelashes upon the reconstructed lid, and she uses some black pigment in the region of the eyebrow to make the partial absence of hair there less conspicuous. The upper lip has been repaired, so as to avoid the unseemly showing of her teeth, by a large flap with a pedicle near the tragus taken from the temporal region. Something was gained in giving length to the upper lip by drawing the tissue from the other side of the face. This was accomplished by detaching the lip on the right side from the nose. The lower lip was turned inward in order to prevent the continual overflow of saliva, by slipping upward the tissues of the chin and closing the wound in the neck by making lateral dissection of the edges of the wound.

The many plastic procedures which were required by this case need not be detailed, but it will be seen from comparison with her photograph that her countenance has been made much less disfiguring. The left side of the face is, of course, almost immobile as far as facial expression is concerned, because the cicatricial contraction of the deep burn affected the muscles of the face as well as the skin. I, of course, have only been able to replace the cutaneous and subcutaneous structures, and have not been able to pro-

vide any substitutes for the underlying destroyed muscular tissue. In cases of such gravity as this it is impossible to get motion so as to reproduce the true facial expression. The absence of disfiguring contractions, however, is very satisfactory to the patient in such extensive deformities. The fact that the woman has submitted to repeated operations shows how much she feels that she has been benefited. For a long time she would not appear before people without having the left side of her face covered. At the present time she is no longer timid in this respect, since the plastic operations, combined with the wearing of an artificial eye and the pigmentation of the eyebrow, make her feel comparatively inconspicuous.

CASE III.—This man had a remarkable congenital deformity, consisting of a mass of hypertrophied skin and subcutaneous tissue which hung down over the left side of the face and eye in a pendulous manner. The tumor is a congenital hypertrophy of the skin and subcutaneous tissue. It involved nearly the whole of the left side of the scalp, the left side of the forehead and the left cheek. He is unable to use his left eye because of the great mass hanging down from the brow. This condition, sometimes called congenital elephantiasis, is not a true elephantiasis, but a simple hypertrophy of

the skin and subcutaneous tissue. The tumor has grown as the man grew, but has not involved any additional areas. It is, of course, non-malignant.

A week ago I cut away all of the growth which existed below the line of the eye, leaving the whole cheek denuded of cutaneous covering. I then dissected a large cellulose-cutaneous flap from the back and side of the neck with a pedicle behind the ear and twisted this in position. Union has taken place almost completely by first intention, and the granulated wound left by the transfer of tissue is healing nicely. I would have put skin grafts upon it, but did not desire to prolong the operation, which was rather a bloody one. I shall at a future time remove the pendulous and hypertrophied tissue from the forehead and brow and perhaps also remove that from the scalp. I shall replace the skin of the forehead with a flap from the back of the left forearm somewhat as a nose is made by the Italian method.

I have presented these patients, with photographs showing their original condition, because I believe that many patients and some physicians do not realize what can be done to relieve the unfortunate victims of such distressing deformities.

## DISCUSSION.

DR. M. B. HARTZELL said that he would not classify this case as an elephantiasis. Elephantiasis is an immense overgrowth of fibrous connective tissue. The latter is plainly absent in the growth exhibited, which consists of soft folds of skin and is really an enormous nevus.

DR. JOHN B. ROBERTS acknowledges, that the growth is not a true elephantiasis

although such cases are apt to be called elephantiasis by surgeons. It is really a congenital hypertrophy of the skin and superficial fascia. The word nevus in surgical literature is so apt to be restricted to angioma that it almost struck him as inapplicable here, because it suggested that the growth is vascular, whereas it is nothing of the sort.

## THE DIAGNOSIS AND RELIEF OF CARDIAC PAIN.

BY H. A. HARE, M.D.

Read November 9, 18'8.

PAIN in the neighborhood of the heart occasions more alarm than pain felt in any other part of the body, and it at once develops, in the minds of the laity, a fear of impending grave danger. As a matter of fact, however, the majority of patients presenting themselves for treatment with the belief that they have cardiac lesions possess healthy hearts, while on the other hand many of my hearers must have been impressed by the fact that those who really possess diseased hearts are often entirely ignorant of that fact. Pain in the region of the heart is either due to functional or organic changes in adjoining tissues or in the heart itself, and the probability of its being organic is slight if the patient be young and decided if he be old.

The forms of cardiac pain which are not organic and which are commonly met with are as follows: In the first place a large proportion of cases with pain in this area suffer from neuralgia of the intercostal nerves, which is increased by exertion or deep breathing. Often it is so severe as to make the patient catch his breath, or more commonly he unconsciously breathes in a superficial manner in order to avoid moving the neuralgic nerve, and so gradually impairs his respiratory activity to such an extent that he feels oppressed and dyspneic, a condition which greatly increases his distress, as he regards this symptom as confirmatory of his own diagnosis of heart-lesion. The darting character of the pain and its superficial position, the fact that spots of superficial tenderness can often be found over its course by slight or deep pressure, and that a tender spot can be found at the origin of the nerve in the back, will aid in clearing up the diagnosis and in

relieving the mind of the physician and patient, particularly if the heart-sounds are normal and arterial sclerosis is not discovered.

In another so-called cardiac pain the difficulty is due to an accumulation of gas under the heart in the angle where the transverse colon turns to form the descending colon. As a result of this not only pain but cardiac palpitation and arrhythmia are produced by reflex causes even when the general belly may not seem to be very tympanitic. This pain I have met with most frequently in women with relaxed and pendulous abdomens, who take little exercise, often overfeed themselves with foods productive of gas and have actual syncopal attacks from this cause.

These syncopal attacks may be the most alarming part of the ailment, and give rise to the belief that degenerative changes are present in the myocardium or coronary vessels. During the attack the irregular action of the heart, its feebleness and its distant sounds may, if the physician is seeing the case for the first time, make a differential diagnosis almost impossible. Sometimes the distention of the abdomen is not sufficient to account for the symptoms, yet percussion of the lower ribs on the left, in the area of Traube's semi-lunar space, will reveal marked tympany. An important point in diagnosis is that, between the attacks, the heart sounds will be normal and the pulse-tension healthy, whereas in true angina pectoris there will always be found high tension, with exaggerations of the tension during the attack. Similar attacks due to identical causes may occur in men, but are more rarely met. Usually they are evidently "high livers," taking little exer-

cise and having engorged abdominal viscera from overeating. Their attacks are prevented by regulation of the diet and by purgatives. Closely associated with these forms of cardiac pain, without a marked lesion, is that found in persons who use tobacco to excess, and it is to be remembered that the excess of one man is not the excess of another. That is, one man can smoke indefinitely without any symptoms; another must cease after one cigar. In most cases that I have seen, the pain complained of has been really due to an intercostal neuralgia due to tobacco plus cardiac palpitation due to the same cause. In one under my charge very recently, however, this was not the case. It was that of a man under 30, who had been much confined to the house for some weeks. He then took a long railroad journey in a smoking-car, filled with smoke, and himself smoked four strong cigars. On leaving the train he was seized with an attack of cardiac pain, which caused him to fall unconscious in the street. When first seen by me he was free from pain, and his heart was feeble and depressed, his pulse relaxed. At varying intervals, however, during the next few days, he was seized with truly frightful cardiac agony, in which he would go into opisthotonos and beat his precordium or shoulder with his right hand, the left hand remaining extended. He stated that the pain started about his heart, passed into the side of his neck, and then radiated down his left arm to the finger tips, and that the agony was so horrible that he beat his chest for this reason. His face and chest during one of these attacks was scarlet red, but not pale or cyanotic as it is in angina, and his arterial tension was uniformly low, and particularly low in the attack. The nitrites were unavailing. Each attack was associated with violent vomiting, and this seemed to indicate the general involvement of the vagus in a neurosis. Repeated careful physical examinations failed to reveal any signs of organic disease or tachycardia. During the attack the heart-sounds were very distant and feeble. Similar attacks had been suffered from a year before under similar conditions. Such attacks have been described in some degree by Bean in the *Journal de Med. de Chirurgie* for July, 1862.

There seems to be also a form of cardiac pain due to gastric disorder, which reflexly disturbs the cardiac branches of the vagus

as well. It may exist side by side with that just described, or follow an attack of indigestion due to imprudence in food or drink. This condition is best described by the following case under my care simultaneously with the last:

A physician of 50 years was seized with violent cardiac pain and palpitation about five o'clock in the afternoon, and again at seven that night. The pain was felt in the left arm and chest, and was very severe. The patient was recovering from an alcoholic debauch, and his stomach was sour and disturbed. After each attack, in which he was flushed, not pallid, he vomited violently. His pulse was rapid rather than slow; there was an abnormally low tension of his pulse, and his heart-sounds were distant and feeble in the extreme. Proper treatment of his stomach was followed by relief. The same patient was under my care a year ago for the same condition after a debauch, and had no attacks between the two named.

Much more mild, but nevertheless painful and alarming attacks have been seen by me in students who continue smoking after the Summer holidays are over, and have to lead sedentary lives.

Finally, among these forms of non organic, cardiac pain, we must consider false angina pectoris. This is most frequently seen in hysterical neurotic women or girls, is associated with pallor, a gasping cry, and more or less complete syncope. The pain is rarely excessively severe, and is described as if the heart were being overdistended, whereas that due to true angina is described as if the heart were crushed in a vise. In the few cases that I have seen, the pain in the arm has not been marked, unless suggested to the patient. The facts that the patient is a young female, that the arterial walls are not sclerotic, that there is evidently a neurotic tendency, and finally that true angina pectoris is comparatively rare in women, are to be recalled. Thus, true angina pectoris occurred in only 47 women out of 227 cases quoted by Huchard, and according to Quain, the disease occurs in 80 per cent. of the cases after 50 years of age. It is true that false angina also occurs in a severe form at the menopause, but here again the character of the pain, the history of the case, and the absence of vascular disease excludes true angina. However, it is not to be forgotten that marked vaso motor disturbances accompany

this state. The hands are often very cold and clammy, and the skin generally relaxed. Further, if the aortic sound is normal and not accentuated, the tension low, and the kidneys normal, true angina is to be excluded. The patient may be flushed instead of pale, is restless and frightened, or moaning, and is markedly nervous, while absolute immobility with an expression of agony and anxiety is the state in true angina pectoris. Finally, the pain often lasts for some hours, whereas in the true form it is fleeting, as a rule.

Lastly, in connection with these forms of cardiac pain, independent of true cardiac lesions, we must recall the so-called vasomotor angina which attacks susceptible persons on exposure to cold, which produces a vascular spasm, an increased resistance to the heart and syncope. The cyanosis and pallor, the contracted arteries and small pulse all indicate true angina, but no heart or chronic vascular lesions can be found.

Passing from the indirect or functional forms of cardiac pain, we approach those due to actual heart-lesions. With many persons, the only form of true cardiac pain is thought to be that of true angina. As a matter of fact, severe cardiac pain, due to other causes, is far more commonly met with.

The pain of mitral stenosis is certainly not recognized with sufficient frequency, at least this has been my experience. In the first place much emphasis is not laid upon the constancy of this system of valvular disease, and secondary mitral stenosis is a valvular lesion often overlooked; first, because it is not sought for as carefully as the more common lesions; second, because it is not as readily heard or differentiated as the others; and finally, and this fact is very important, the period in which the pain develops is often that of advanced cardiac breakdown when the action of the heart is so irregular that its sounds are not readily separated, but are confused, and when the auricle is so dilated and feeble that it cannot force the blood through the obstructed orifice with sufficient power to produce a murmur loud enough to be heard above the confused sounds or gallop rhythm of the heart. The following case illustrates these facts very clearly: A man of 28 years was admitted to my wards, suffering from marked dyspnea, incessant, unproductive cough, and a pulse of an extremely irregular type as to force,

volume and rhythm. There was, however, no atheroma of his vessels and no edema of the lungs or extremities. The area of his apex beat was very diffuse, and its greatest intensity a little below the normal and to the left of the normal spot. A diffuse but indistinct thrill reached to the second left interspace, and percussion revealed an enlargement of the left auricle. A careful examination of his heart revealed absolutely no murmur, but a most tumultuous throbbing, with such a jumbling of the sounds that they could not be separated. Digitalis and all other cardiac tonics failed to relieve him or to separate the sounds by making the heart more regular. Far more important to the patient were the fearful paroxysms of pain which, beginning in his left chest, spread to the shoulder and left arm and hand. These attacks nearly always came on at night without apparent cause, and were agonizing. The man dropped over dead in an attack while propped up in bed, this being the position he had held for days. At the autopsy great distention of the left auricle and a button-hole mitral orifice was found scarcely big enough to admit a pencil.

These attacks of pain, believed to be somewhat similar to those of true angina pectoris, arise from great engorgement or distention of the auricle, whereas in the true angina of arterial spasm it is the left ventricle which is overdistended. I have seen severe cardiac pain in so many cases of marked cardiac arrhythmia without demonstrable murmur that I look for a button-hole mitral orifice to be found if the case comes to autopsy, for in no other valvular lesion is pain so constantly met or so severe.

Next to this cause of cardiac pain stands that due to aortitis. This condition is rarely acute, but if so, the pain is exceedingly severe. In the chronic forms it is also somewhat constant and severe and characterized by paroxysms. How far these attacks depend upon alterations in the blood-supply of the coronary arteries and how far upon a neurosis it is difficult to determine. Such attacks, however, must be separated from those of true angina pectoris if possible. This is accomplished in some cases by the presence of more or less constant pain in the aortic area, by the discovery of a constant aortic systolic murmur indicating aortic roughening, and by the paroxysms involving the



upper part of the chest rather than the heart itself.

Closely associated with the pain of aortitis is that due to aortic regurgitation, in which state pain may be an early symptom and actually simulate angina. Sometimes the pain is mild and constant, in other cases it is paroxysmal, and it often radiates down the arms, particularly the left, as do all severe cardiac pains.

General cardiac dilatation also causes cardiac pain, probably by pressure on surrounding tissues, and in one case, under my care, an enormous cardiac dilatation, subacute in character, but following an acute dilatation due to lifting a heavy weight, the pain was perhaps the most prominent symptom. The diagnosis of this cause of pain is readily made on a physical examination and in association with an injury. In the case I have cited the man immediately after the acute effort, which produced dilatation, gasped and tore his shirt away from his throat with his hands because of the agony.

True fatty degeneration of the heart is rarely associated with true pain, the condition being more of discomfort. So, too, in fibroid heart anginal attacks are not rare.

We may pass on to the consideration of true angina pectoris, and in doing so regard it as a condition comparatively rarely met with in its classic forms. It is emphatically a disease of the well to do, or at least of the class which do not perform manual labor for a living, and it seems peculiarly a disease of professional life, chiefly in medicine and law, or at least in those persons who are subjected to periods of great nervous strain, as for example in financiers. In the lower classes equally marked arterial degeneration ensues, but for some reason it has seemed to the writer that high arterial spasm is not so common with the change as in the upper classes, thereby emphasizing the nervous element in these cases.

Great caution in making the diagnosis of true angina pectoris should be taken. Only where the pain is severe, the patient advanced in years, and the signs of degenerative arterial change are present, should this decision in a given case be reached, and then only after all other causes of cardiac or thoracic pain have been excluded. On the other hand, it is important to recall the fact that the pain of true angina may not be

typically cardiac, and may appear to be felt most severely in the epigastrium, and marked gastric disturbance, with belching and vomiting, may be present as a result, in all probability, of a general nerve-storm in the pneumogastric filaments; and if such gastric symptoms occur in a woman, a suspicion of hysteria should always be entertained. It would seem, too, that the intercostal nerves are also involved in the nerve-storm to the extent that areas of marked hyperesthesia of the skin of the chest often exist; and that these are not the only ones of the cerebro-spinal system affected, is shown by the fact that the numbness of the left arm, due to involvement of the left ulnar nerve, may be present for some time after an attack; that Eichhorst reports wasting of the muscles supplied by this nerve in anginal cases; and finally, that actual spasm of the muscles of the left arm may ensue.

The mental anguish, the fixed expression of the face and chest, the slow and feeble pulse, the shallow expectant respirations, the ashy skin and cold sweat are the symptoms which make the symptom-complex of this disease.

Aside from the cardiac pains already named we must recall that of aortic aneurysm, pericarditis and pleurisy. The last of these is readily recognized; the other, particularly the aneurysm, is often overlooked because it is not sought for, or because, being deeply seated, it cannot be found. Personally I believe cardiac pain to be due to this cause more frequently than is recognized. The pain of aneurysm is often paroxysmal, radiates in directions like that of true angina, and the pressure of the growth paralyzes or benumbs nerve-trunks and produces hyperesthetic areas in the skin of the chest. The following case is an instance of how easily such a lesion is overlooked. A man aged about 50 entered my wards in the Jefferson Hospital, suffering from frequently recurring attacks of violent cardiac pain radiating down the left arm. He also had advanced parenchymatous renal disease, and was profoundly affected by universal anasarca. An examination of his heart was difficult because of his dropsy; its sounds were distant and feeble, and no murmur was detected on repeated examination. A diagnosis of renal disease with secondary anginal attacks was made. The man died suddenly, and the autopsy revealed the aorta, from its origin

to the descending portion of the arch, to be the seat of a large aneurysm.

What can be done for the relief of the various forms of pain just considered is the question which at once presents itself to the practical mind. Those forms which are due to excesses in the use of tobacco or alcohol, often associated with undue sexual activity, are of course to be relieved in great measure by regulating the habits of the patient, and in this matter only careful questioning, and still more exact directions, will be of service; for the idea of many persons as to what constitutes excess is very odd. Thus many men consider themselves moderate smokers if they smoke seven or eight cigars a day, and it is very common to find men who are quite shocked if they are told that a drink of whisky before breakfast is an excess, for they regard excess with alcohol as equivalent to intoxication. With these facts, and with the question of what is sexual excess, the physician must decide what is excess for one, and what is excess for another, and lay down strict directions to the amount of tobacco, alcohol, and Venus. The types of intercostal neuralgia described are to be treated by the usual antineuralgic remedies, by counter-irritation over the spine, by improving the general health, and by proper exercise. In the pain due to gas in the transverse colon, regulation of the diet, calisthenics or outdoor exercises and carminatives are useful, particularly Hoffman's anodyne, which at once expels wind, and overcomes any tendency to syncope. When the attack arises from acidity of the stomach, then, of course, aromatic spirit of ammonia is the remedy.

The treatment of pseudo-angina pectoris is more difficult, for the neurotic element of the case is here a dominant feature. Gentle and gradually increasing exercise is by far the best cure for these patients. A careful study of the blood should be made to determine the degree of anemia and the presence of malarial infection, and if these states are present treatment should be directed to them.

The diet, the condition of the digestion, and, on its occurrence, constipation, are to be regulated and Hoffman's anodyne prescribed to be used in the event of an attack. Arsenic is very useful, as is also aconite, and frequently an ice-bag placed over the heart will give relief.

For the forms of cardiac pain due to vasomotor disturbance the treatment depends on the condition of the vessels. If the surface is pallid, atropin may be used, if flushed, aconite may be employed, or nitroglycerin given if there is arterial spasm. As a prophylactic measure the use of cold bathing is of value, beginning with tepid water and gradually decreasing its temperature till the patient reacts completely to the cold bath.

The pain of mitral stenosis is fortunately more rarely met with than that of the functional disorders, for it is far more difficult to relieve.

There is no heart-pain so difficult of treatment, for it depends upon a definite anatomic lesion and is not dependent upon vascular changes. I have come to regard morphin as our only useful drug in this state. In aortitis the use of arsenic and the iodids not only tend to cure the disease, but relieve the pain very markedly in some cases. Aconite and nitroglycerin may be given to relieve high arterial tension if it is present, and digitalis to aid the heart if it is failing. When the pain is due to aortic regurgitation, digitalis must, of course, be used with care.

In the presence of dilatation of the heart, absolute rest, the use of cold or belladonna to the precordium, and the use of digitalis or strophanthus, is of value. As the dilated heart cannot pump blood against the high pressure of the arterial pressure produced by digitalis, this drug must be used cautiously. The pain of true angina is to be treated in a manner familiar to us all, and need not be considered at this time, and that of aneurysm by rest, the iodids and aconite, or by the operation of electrolysis.

## DISCUSSION.

DR. J. H. MUSSER said that Dr. Hare stated well the frequency of angina among the better classes. Those who have had two classes of hospital practice—that of the ward and that of the private room—can bear this out. Cases of angina are rare in the Philadelphia Hospital, while in private practice they are not uncommon. The infrequency of angina among the poor and debilitated is probably due to poor nutrition of heart associated with some dilatation. It is rare to meet angina pectoris associated with dilatation of the heart. Attention was invited by Dr. Musser to anginoid pain sometimes occurring in patients who take digitalis. He has seen it frequently occur, and in several instances the pain persisted until the drug was withdrawn. The high tension produced by the digitalis apparently caused sufficient intraventricular pressure to provoke pain. Such a case was under the care of Professor Da Costa and Dr. Musser last winter. The patient suffered from a large white kidney, a form of chronic nephritis that, in this case, frequently seemed in need of digitalis, the indication being to overcome secondary dilatation and to bring about diuresis. The old-fashioned pill, digitalis, calomel and squill, was found more serviceable than any other remedy. But the administration of the digitalis was invariably followed, in a short time, by high tension and the occurrence of cardiac pain that was only relieved by nitroglycerin or some remedy that dilated the peripheral vessels. This experiment, for such it was, occurred a number of times throughout the course of the case. Several instances of digitalis producing anginoid and true anginal attacks have been observed by Dr. Musser. He suggests that the administration of this remedy be accompanied by a watch for cardiac pain. Its occurrence should signal the withdrawal of the drug at least for a time. The explanation of the cause of this pain may not be correct, but the facts are that digitalis, high arterial tension and pain were associated, and that the latter was relieved as soon as the digitalis was discontinued or as soon as some other drug was employed.

DR. ANDERS told of an incident and expressed a thought. The incident dealt with a young man convalescing from typhoid

fever, who, contrary to advice, sat up and attempted to walk across the room. His indiscretion was followed by acute dilatation of the heart. His pain subsided under the use of aromatic spirits of ammonium, and later of digitalis. It is an instance where digitalis did not cause, but, on the contrary, took away a pain. The "thought" was born of remembrance of the frequency with which patients come into a physician's office with pains alleged to be located in the heart, but which are often found to be due to pleurodynia, to intercostal neuralgia, and to dilatation of the stomach, either acute or chronic.

DR. JELKS took issue with Dr. Musser upon the propriety of giving digitalis to any man who has an inflamed or degenerated kidney. He offered the following explanation why poor people usually escape cardiac pain and angina pectoris. The majority of cases of angina occur after 35 years of age. Rarely has he seen any before that. They are all good livers, men who drink and smoke a good deal, and who are in comfortable circumstances. They are all uric acid patients, and the symptoms are uric acid symptoms in the majority of cases. The bulk of these cases occur out of faulty elimination. Prior to that time men are younger, more active, and have not accumulated the stored uric acid which, after a while, under some special circumstances, floods the heart with its physiologic poisons. Hence, the heart pains will be relieved by the salicylates, especially the salicylate of sodium. He has met a great many of these cases, and knows of nothing that acts so well as the salicylates.

DR. H. A. HARE, in closing the discussion, emphasized some points made in his paper. He remarked the frequency with which excessive use of tobacco produces various forms of cardiac and other pain. As an instance he told of a young man who suffered pain, beginning in the left epigastrium, passing thence to the left chest and shoulder-blade, and which incapacitated him from work. He consulted a number of physicians and finally Dr. Hare, who, learning that the man smoked to excess, insisted that this was the chief cause of his pain. In stopping his tobacco the pain stopped too. Dr. Mitchell recently called Dr. Hare's attention to a similar instance. It was that of a nerve-

storm, in a man who had been told by a number of physicians that he had petit-mal. Dr. Mitchell restrained the man's use of tobacco and his petit-mal is well.

Reference was made by Dr. Hare to a paper by him upon the vaso-motor system as a factor in disease. He noted that physicians, when treating patients having trouble with their vascular system, nearly always paid exclusive attention to the heart and neglected the needs of the distributing bloodvessels. As the pipes in a water-supply must be kept in good condition as well as the pumping station, so it does very little good to give cardiac tonics unless at the same time careful attention is paid to arterial tension. Where digitalis is administered with actual harm to the patient it is due to the fact that he has already high arterial tension, the physician thinks the heart is weak, gives digitalis and ignores the fact that digitalis is an equally powerful stimulant to the vaso-motor system. The fact that digitalis is composed of a number

of active principles which have a very different physiologic action, acting on different portions of the heart and the nerves governing the heart, is too often forgotten. A weak heart with high tension should be treated with the fluid extract or tincture, because their alcohol holds in solution the peculiar principles which are needed. Where a diuretic effect is desired the infusion of digitalis should be used, because the active principle of digitalis, which is peculiarly diuretic in its influence, is soluble in water and insoluble in alcohol. This explains in some cases why digitalis causes pain, such as has been noted by Dr. Musser. If he had employed the infusion he would have used a remedy containing digitalein, and enough digitalin and digitonin to produce sufficient stimulation and not containing enough digitoxin to produce any spasm or pain. In prescribing digitalis there should be an equal regard of its effects on the vaso-motor system as well as upon the heart itself.

## THE NATURE OF LEPROSY OF THE BIBLE.

BY JAY F. SCHAMBERG, M.D.

Read November 9, 1898.

THE nature of the leprosy described in the thirteenth chapter of the Book of Leviticus has been the subject of considerable research on the part of medical and biblical scholars.

That there should exist to-day diversity of opinion upon the nature of this disease, is not surprising when the difficulties attending the translation of the biblical text are properly understood.

During the past four thousand years, the Hebrew language has been undergoing the evolutionary changes to which all languages are subject. There can be no doubt that the meanings of some words have been so modified that their primitive signification has been entirely lost. It is a philologic axiom that the older a language becomes, the more do the words draw away from their etymologic progenitors. And so the translators of the Bible have been confronted with the difficult task of translating certain Hebrew words, the exact meanings of which had been lost during the march of centuries. These words which conveyed definite and specific ideas to the writers of the Bible, have been translated only with the aid of the etymologic key. Such translations, while approximate, are often sufficiently inexact to lead to grave error. Medical terms, such as are used in the description of leprosy, have been particularly difficult of translation. This may account for some of the incongruities in the translated text.

In discussing the nature of the leprosy of the Bible, the question which naturally presents itself for solution is: was the leprosy of the Bible identical with modern leprosy? Let us therefore institute a comparison between the "tsaraath" of the biblical writers and the disease now known as leprosy.

Turning to the thirteenth chapter of Leviticus (King James version), we read:

2. When a man shall have in the skin of his flesh a rising, a scab, or bright spot, and it be in the skin of his flesh like the plague of leprosy; then he shall be brought unto Aaron the priest, or unto one of his sons the priests:

3. And the priest shall look on the plague in the skin of the flesh; and when the hair in the plague is turned white, and the plague in sight be deeper than the skin of his flesh, it is a plague of leprosy; and the priest shall look on him, and pronounce him unclean.

4. If the bright spot be white in the skin of his flesh, and in sight be not deeper than the skin, and the hair thereof be not turned white; then the priest shall shut up him that hath the plague seven days:

5. And the priest shall look on him the seventh day: and, behold, if the plague in his sight be at a stay, and the plague spread not in the skin; then the priest shall shut him up seven days more:

6. And the priest shall look on him again the seventh day: and, behold, if the plague be somewhat dark, and the plague spread not in the skin, the priest shall pronounce him clean: it is but a scab, and he shall wash his clothes, and be clean.

7. But if the scab spread much abroad in the skin, after that he hath been seen of the priest for his cleansing, he shall be seen of the priest again:

8. And if the priest see that, behold, the scab spreadeth in the skin, then the priest shall pronounce him unclean: it is a leprosy.

9. When the plague of leprosy is in a man, then he shall be brought unto the priest;

10. And the priest shall see him: and, behold, if the rising be white in the skin, and it have turned the hair white, and there be quick raw flesh in the rising;

11. It is an old leprosy in the skin of his flesh, and the priest shall pronounce him unclean, and shall not shut him up: for he is unclean.

12. And if a leprosy break out abroad in the skin, and the leprosy cover all the skin of him that hath the plague from his head even to his foot, wheresoever the priest looketh;

13. Then the priest shall consider: and, behold, if the leprosy have covered all his flesh, he shall pronounce him clean that hath the plague: it is all turned white: he is clean.

14. But when raw flesh appeareth in him, he shall be unclean.

15. And the priest shall see the raw flesh, and pronounce him to be unclean: for the raw flesh is unclean: it is a leprosy.

16. Or if the raw flesh turn again, and be changed unto white, he shall come unto the priest;

17. And the priest shall see him: and, behold, if the plague be turned into white; then the priest shall pronounce him clean that hath the plague: he is clean.

18. The flesh also, in which, even in the skin thereof, was a boil, and is healed,

19. And in the place of the boil there be a white rising, or a bright spot, white and somewhat reddish and it be shewed to the priest;

20. And if, when the priest seeth it, behold, it be in sight lower than the skin, and the hair thereof be turned white; the priest shall pronounce him unclean: it is a plague of leprosy broken out of the boil.

21. But if the priest look on it, and, behold, there be no white hairs therein, and if it be not lower than the skin, but be somewhat dark; then the priest shall shut him up seven days.

22. And if it spread much abroad in the skin, then the priest shall pronounce him unclean: it is a plague.

23. But if the bright spot stay in his place, and spread not, it is a burning boil; and the priest shall pronounce him clean.

24. Or if there be any flesh, in the skin whereof there is a hot burning, and the quick flesh that burneth have a white bright spot, somewhat reddish, or white;

25. Then the priest shall look upon it: and, behold, if the hair in the bright spot be turned white, and it be in sight deeper than the skin; it is a leprosy broken out of the burning: wherefore the priest shall pronounce him unclean: it is the plague of leprosy.

26. But if the priest look on it, and behold, there be no white hair in the bright spot, and it be no lower than the other skin, but be somewhat dark; then the priest shall shut him up seven days:

27. And the priest shall look upon him the seventh day: and if it be spread much abroad in the skin, then the priest shall pronounce him unclean: it is the plague of leprosy.

28. And if the bright spot stay in his place, and spread not in the skin, but it be somewhat dark; it is a rising of the burning, and the priest shall pronounce him clean: for it is an inflammation of the burning.

29. If a man or woman have a plague upon the head or the beard;

30. Then the priest shall see the plague: and, behold, if it be in sight deeper than the skin; and there be in it a yellow thin hair; then the priest shall pronounce him unclean: it is a dry scall, even a leprosy upon the head or beard.

31. And if the priest look on the plague of the scall, and, behold, it be not in sight deeper than the skin, and that there is no black hair in it; then the priest shall shut up him that hath the plague of the scall seven days:

32. And in the seventh day the priest shall look on the plague: and, behold, if the scall spread not, and there be in it no yellow hair, and the scall be not in sight deeper than the skin;

33. He shall be shaven, but the scall shall he not shave; and the priest shall shut up him that hath the scall seven days more:

34. And in the seventh day the priest shall look on the scall: and, behold, if the scall be not spread in the skin, nor be in sight deeper than the skin; then the priest shall pronounce him clean: and he shall wash his clothes, and be clean.

35. But if the scall spread much in the skin after his cleansing

36. Then the priest shall look on him: and, behold, if the scall be spread in the skin, the priest shall not seek for yellow hair; he is unclean.

37. But if the scall be in his sight at a stay, and that there is black hair grown up therein; the scall is healed, he is clean: and the priest shall pronounce him clean.

38. If a man also or a woman have in the skin of their flesh bright spots, even white bright spots;

39. Then the priest shall look: and, behold, if the bright spots in the skin of their flesh be darkish white; it is a freckled spot that groweth in the skin; he is clean.

40. And the man whose hair is fallen off his head, he is bald; yet he is clean.

41. And he that hath his hair fallen off from the part of his head toward his face, he is forehead bald: yet he is clean.

42. And if there be in the bald head, or bald forehead, a white reddish sore; it is a leprosy sprung up in his bald head, or his bald forehead.

43. Then the priest shall look upon it: and, behold, if the rising of the sore be white reddish in his bald head, or in his bald forehead, as the leprosy appeareth in the skin of the flesh;

44. He is a leprous man, he is unclean: the priest shall pronounce him utterly unclean; his plague is in his head.

45. And the leper in whom the plague is, his clothes shall be rent, and his head bare, and he shall put a covering upon his upper lip, and shall cry unclean, unclean.

46. All the days wherein the plague shall be in him, he shall be defiled: he is unclean: he shall dwell alone; without the camp shall his habitation be.

According to the above description, the characteristic features of leprosy were: (1) the existence of white bright spots on the skin, the hair of which had also turned white; (2) the depression of the patches below the level of the skin; (3) the existence of quick raw flesh; (4) the spreading of the scab or scall.

Now let us turn to modern leprosy. Leprosy is a chronic, infectious disease, caused by the introduction into the system of a specific microorganism, and affecting chiefly the skin and the nervous system. There are two forms, the tubercular or nodular, and

the anesthetic or nervous form. A mixed variety may also occur.

The tubercular form begins as an erythematous eruption, consisting of round or irregular-shaped spots of a mahogany or sepia color. These slowly disappear, leaving behind brownish pigmentations, which, in the course of time, become the seats of tubercular infiltration. In an advanced case, the face is covered with firm, livid, nodular elevations, between which are evident deep furrows corresponding to the natural lines of the face. This is particularly marked upon the forehead, and gives to the patient the so-called leonine expression. The nose, lips and ears are swollen beyond their natural size, the eyelashes and eyebrows are lost, the eyes are staring, the whole producing a hideous disfigurement.

In the anesthetic form of leprosy, the first manifestation upon the skin consists of large blebs, which rupture, leaving whitish cicatrices or pigmented stains. Or there may appear bluish-red or reddish-brown spots, later becoming yellow. Occasionally, white spots, much whiter than the rest of the skin, occur. In the beginning, there is increased sensibility over these areas; later, however, the sensation is impaired, and finally lost, so that the prick of a pin is no longer felt. The patient suffers much from terrible shooting pains along the nerves. As the disease progresses, the limbs become paralyzed, the muscles waste, and the skin becomes harsh and dry. The patient loses strength, and becomes bedridden. Ulceration and gangrene occur, involving the fingers and toes, or even the hands and feet. These members rot off, leaving discharging and mutilated stumps. The patient, weakened by the ravages of this disease, falls easy prey to intercurrent affections.

Now, comparing this with the Levitical description, we are immediately struck by the absence of all allusion in the latter to the hideous facial deformity. If such had existed, it could not possibly have escaped observation. We must, therefore, take it for granted that it did not exist.

Although improbable, it is still within the bounds of possibility that the tubercular variety of leprosy was not known in biblical times, whereas the anesthetic form was. Whilst tubercular leprosy comprises 50 to 70 per cent. of all cases in temperate climates, it falls as low 20 or even 10 per cent. in

tropical countries. It is then with anesthetic leprosy that we will compare "tsaraath."

It is true that bright white spots do occur in the early stages of anesthetic leprosy. These are, however, far from constant. The spots are much more likely to be reddish, brownish, or yellowish in color. Indeed, the white spots are so infrequent that no mention is made of them in the ordinary text-books on the subject, but only in the most exhaustive treatises.

And yet the Talmud lays so much stress upon the degree of whiteness that it subtly distinguishes four grades of white, and compares them to snow, limestone, the membrane of an egg, and the wool of a newly-born lamb.

The hair of the body in leprosy becomes brittle and falls out; when it remains, it may become white. This is diagnostically of so little importance that it is barely mentioned in the whole literature of the subject, and yet this was regarded as the pathognomonic sign of "tsaraath."

The most characteristic sign of anesthetic leprosy is the occurrence of loss of sensation over discolored spots. The color of the spot and of the hair upon it is of no importance. There is absolutely no mention in the Levitical text of loss of feeling in the white spot. There is likewise no mention of paralyzes, wasting of muscles, shooting pains, and, most remarkable of all, of the terrible mutilations.

The Levitical code prescribed that the several examinations of the suspected patient should be made at intervals of seven days, thus enabling the priest to note the progress of the disease. Leprosy is an exceedingly slow disease, particularly in the beginning, and a fortnight would show absolutely no change in the vast majority of cases.

Now if the biblical description did not refer to leprosy, to what did it refer? Did there exist four thousand years ago a disease which has since become extinct? Possibly. There is, however, a far more plausible explanation. The probabilities are, that the term "tsaraath" comprised a number of cutaneous diseases which, owing to the undeveloped state of the medical sciences at that period, were grouped together as a clinical entity.

The white spots referred to were beyond all doubt vitiligo. Vitiligo is a disease quite common in tropical countries, charac-

terized by bright white spots, the hairs of which lose their color and become white. The disease begins as small patches which slowly spread, often involving ultimately large areas of the body surface. Cases are on record of negroes affected by this disease turning entirely white. The affection is an absolutely harmless one; it does not compromise the general health, and is only objectionable on account of the disfigurement that it occasions. It is, however, refractory to all treatment, and practically incurable, although cases are recorded to have been cured spontaneously.

Whilst this description is fresh in our minds let us refer again to the thirteenth verse of the thirteenth chapter of Leviticus:

"Then the priest shall consider: and, behold, if the leprosy have covered all his flesh, he shall pronounce him clean that hath the plague: it is all turned white: he is clean."

This verse would be quite inexplicable if this were regarded as leprosy, for it partakes of the nature of a paradox that the spreading of a diseased area over the entire body should be interpreted as rendering one clean or free from disease. Furthermore, no one has ever observed a leper turn entirely white.

This verse can be readily explained under the assumption that the disease was vitiligo. The turning white of the entire body surface would cause the obliteration of all spots, inasmuch as there would then be uniformity of color. Vitiligo having no other symptoms, the patient would to all intents and purposes be well or clean.

Verses 7 and 8 read:

"But if the scab spread much abroad in the skin, after that he hath been seen of the priest for his cleansing, he shall be seen of the priest again:

"And if the priest see that, behold, the scab spreadeth in the skin, then the priest shall pronounce him unclean: it is a leprosy."

The disease probably referred to in the above verses is psoriasis, a not uncommon affection characterized by the occurrence of bright, shining, whitish scales upon a reddish, slightly elevated base. The disease spreads slowly or rapidly and may involve large areas of the cutaneous surface. The individual eruption may get well, but relapses are almost sure to occur. The general health is not at all affected.

The occurrence of "quick raw flesh" is by no means characteristic of leprosy, but

occurs in simple ulcers, boils, carbuncles, tuberculosis, cancer, etc., etc.

It might be contended that the "tsaraath" of the Bible had undergone modifications during the lapse of centuries, and had finally terminated in our modern disease of leprosy. This is extremely improbable, as we have a thoroughly authentic and scientifically accurate description of leprosy written by Aretaeus, a Greek physician who lived in the first century of the present era. If leprosy has not changed in the slightest degree within the past 1800 years, it is not likely that it ever presented any deviation from its present picture.

Aretaeus, after a classic description of elephantiasis, dramatically concludes as follows: "Sometimes the members perish before the patient, and one sees the nose, fingers, toes, feet, hands, or genitals drop off, for it is only after dismemberment of the man that death comes to him, as the deliverance from a horrible life and terrible pains. This disease has the tenacity to life that the elephant has."

Ah, it will be urged: if biblical and modern leprosy are distinct diseases, how is it that the ancients and the moderns concur in ostracising and segregating those afflicted with this disease and with this disease alone?

I am of the opinion that scriptural example is the sole factor that has led to the segregating of lepers to-day. It was through an error that a truth was discovered, and an important prophylactic measure made a custom.

It is a well known fact, that during the Middle Ages the diagnosis of leprosy was in chaotic confusion, and that in the medieval leproseries could be found examples of almost every known skin disease.

Had the Bible never been written it is probable that lepers would to-day be at large. The biblical mandate brought segregation about; the verdict of science has maintained it, but this verdict has been a vacillating or, more properly speaking, an oscillating verdict.

In 1867, a commission appointed by the Royal College of Surgeons of England to investigate the nature of leprosy, after an exhaustive study of the disease, reported against its contagious character. Just thirty years later, at the Berlin Leprosy Congress of 1897, there was practically a unanimity of



sentiment concerning the contagious nature of this disease. Such fluctuations of opinion have frequently occurred during the past few centuries.

There are few scientific men who would to-day deny that leprosy is a contagious disease. One positive observation of direct transmission outweighs a score of negative ones. Yet it must be admitted that the contagion is accomplished with a considerable degree of difficulty, and that the conditions of susceptibility and immunity in connection therewith are but little understood. Experimental inoculations of leprosy virus upon man and the lower animals have been repeatedly negative, with the possible exception of Professor Arning's inoculation of the convict Keanu in the Sandwich Islands. This man developed leprosy about a year later, but the experiment was vitiated by the fact that the subject came of a leprosy family.

It is not uncommon in countries where leprosy is endemic, to find healthy men and women living for years in conjugal relationship with their leprous spouses.

The statement may be made unhesitatingly that leprosy is no more contagious than pulmonary consumption, and far less so than syphilis. But for these diseases there was no biblical example of ostracism.

The segregation of lepers, at least of tubercular lepers, is admittedly a wise measure. There is more reason, however, to segregate consumptives and syphilitics, and we are only deterred from so doing by the utter impracticability of the project.

In the consideration of the nature of "tsaraath" we have thus far had recourse to internal evidence alone. Let us endeavor to gain some information through collateral channels.

The earliest translation of the word "tsaraath" into any language was, of course, its rendering into Greek in the translation of the Hebrew Bible, in the third century before the present era. In the Septuagint the word "tsaraath" is translated by the word *lepra*. We are justified, therefore, in believing that the Hebrews attached the same meaning to the word "tsaraath" that the Greeks did to the word *lepra*. Now, *lepra* is derived from *lepros*, which means rough or scaly. According to the medical writings of Aegineta, Aetius, Actuarius, Oribasius, and others, *lepra* is uniformly regarded as a circular, superficial scaly eruption of the skin;

in other words, the psoriasis of modern times. *Lepra* was also regarded by the Greeks as curable, as may be observed in the following quotation from Hippocrates: "Lichen and *lepra* are the more easily cured, the more recent they are, and the younger the patients and the more soft and fleshy the parts of the body in which they occur." There is absolutely nothing in the Greek description of *lepra* that suggests even in a remote manner the modern leprosy.

The Greeks, in speaking of true leprosy, did not use the term *lepra*, but elephantiasis. It is evident, therefore, that they meant by *lepra* an affection distinct and apart from our disease of leprosy.

English and French physicians of the beginning of this century still used the term *lepra* for psoriasis. In 1808, Robert Willan wrote: "By the term '*lepra*,' I mean to express the complaint so denominated by the most accurate of the Greek physicians. It is characterized by the scaly patches of different sizes, but having nearly a circular form."

In 1846, Cazenave, an eminent French dermatologist, wrote: "Medical writers are agreed in designating by the word *lepra*, a squamous affection of the skin characterized by scaly patches with elevated borders and depressed centers."

The confusion and obscurity that have enveloped this subject for centuries, have resulted from the use of different terms in successive ages to designate the same disease, and from the total change in the meaning and application of the word *lepra*.

With the evidence at hand, the following conclusions may be formulated:

1. That the biblical disease known as "tsaraath" comprised a number of cutaneous disorders, chief among which were vitiligo and psoriasis.

2. That there is no evidence in the Levitical description to warrant the belief that leprosy existed among the Jews at that period.

3. That the segregation of lepers had its origin in the biblical example of sequestering those affected with "tsaraath."

4. That the word *lepra* or leprosy is at the present day applied to a totally different disease from that which the Greeks so designated.

5. That translators of the Bible ought not to use the term *lepra* in translating "tsaraath," but ought rather to Anglicize the Hebrew word itself.

## DISCUSSION.

DR. M. B. HARTZELL expressed his interest in the paper of Dr. Schamberg, and his agreement, in a general way, with its conclusions. Intelligent discussion of this subject necessitates a thorough acquaintance with Hebrew. It is very difficult to understand precisely what was meant by the Hebrew word "tsaraath," but it is very likely that it was used in a general sense, just as the word plague was used to indicate any severe or fatal disorder. It is maintained by those who have carefully studied the subject that it was used to denominate any cutaneous disease of an intractable nature that was contagious. Hirsch maintains that it was the equivalent of the German word *schlag* = stroke, which appears in the word, *ausschlag*, eruption. Under this word was contained a great variety of cutaneous disorders, venereal diseases of various kinds, scabies, eczema, and vitiligo. Any one who reads the account in Leviticus of leprosy must be impressed with the special stress laid upon the occurrence of white hairs and white patches. The lesions of leprosy are more frequently bronzed, or red, or sepia color, than white. This description leads to the conclusion that some other disease was meant, probably vitiligo. It cannot be decided that vitiligo alone was meant. The edges in the lesions of Biblical leprosy were depressed, while in vitiligo the edges are even with the surrounding skin. So there must have been other disorders indicated. Again, the very brief period given by the priest for the determination of leprosy, and the provision for the cleansing of healed lepers show conclusively that the regulations were made for some other disease than modern leprosy, which progresses most slowly, and which does not get well.

As an evidence that many diseases were included under the title leprosy, note the repeated use of the phrase, "a plague of leprosy," not the leprosy, but some one of several diseases. Furthermore, leprosy of garments and a leprosy of houses are spoken of, so that any reading of this chapter which is at all carefully done, in the light of what

is known of leprosy in modern times, shows that, in this elaborate and minute description, a variety of diseases was included, and probably leprosy among them, but it is quite likely that diseases such as syphilis, and and other ulcerative diseases, must have been included. The directions given were considered wise to be carried out by the Hebrews. They had learned from sad experience that some of these diseases could be communicated from one to another.

DR. SCHAMBERG expressed himself in full accord with what Dr. Hartzell had said in the discussion of the paper. The Bible, in addition to describing human leprosy, devotes considerable space to the consideration of leprosy of the walls of houses and of garments. If garments contained reddish and greenish spots, which changed their character from week to week, they were regarded as leprous. The Bible also describes leprous streaks upon the walls of houses, and advises that, to effect a cure, the walls are to be scraped. In the event of the return of the discoloration the walls are to be torn down. At the meeting of the Ninth International Congress of Hygiene, Dr. Vallin read a paper upon a microorganismal disease of the walls of damp houses, which reads much like the biblical description of the leprosy of houses. He attributed the disease to the nitrifying bacillus, and advises the same curative measures as are mentioned in the Bible, namely: the scraping of the walls and replastering of the same. The subject of leprosy is interesting both from the popular and the scientific point of view. Now that the Hawaiian Islands have been annexed to the United States, there will be a considerable importation of lepers into this country unless stringent quarantine regulations are enforced. In conclusion, he wished to emphasize the historic fact brought out in his paper, that the segregation of lepers to-day has resulted from the biblical example of segregating the so-called lepers of 4,000 years ago; other diseases, equally or more contagious, are not legislated against.

## THE TECHNIC AND VALUE OF CATHETER INFLATION OF THE TYMPANUM.

BY B. ALEX. RANDALL, M.A., M.D.

Read November 23, 1898.

MOST of the would-be improvements upon the long-used Eustachian catheterization through the nose are not advance steps, but often are re-inventions of exploded measures, and are attempted because the original procedure (which is not truly an "operation" at all) has not been mastered. Otologists must not abandon it because it cannot undo damage long irremediable; but should use it with skill and confidence in the large group of cases where no operation, "patent eardrum" or phono-massage can avail as much if at all. Due care of the nose and pharynx must precede its use, but can rarely render it needless in long-standing catarrhal deafness; and rhinoscopy, which may be well employed to learn any pathological conditions present, will rarely be needed to aid during its performance. This is usually simple if along the floor of the nose the beak of a well-made catheter is gently passed until it is felt to sink over the edge of the hard palate, when outward rotation through a third of a circle will rarely fail to guide the catheter into the mouth of the Eustachian tube. The position of the latter shows little variation; but the back wall of the pharynx and the Rosenmuller fossa, often used as landmarks, have no definite relation to it. The back edge of the septum is a good landmark, if difficulty is met in locating the palate edge. When this occurs the beak should be rotated inward and withdrawn until the septum is engaged, and then be turned outward as before. The ring at the outer end of the instrument marking the direction of the beak should point near the outer canthus of the eye. Virgin silver is the best material for the catheter, which can be easily bent as desired and sterilized by glowing in the flame. The Politzer bag serves excellently for inflation, but should have a

rounded tip which will not wedge in the expanded end of the catheter but form a ball-and-socket joint by resting against it. No valves or interposed rubber-tubing is called for, as without it the bag may be readily withdrawn, and refilled without any jarring; the catheter should be lightly yet very firmly held between the thumb and the fingers, which should rest upon the dorsum of the nose.

The introduction of air alone has limited value, and the stimulation of the diseased tympanic mucosa is best accomplished by vapor drawn into a Politzer bag by filling it from a bottle containing a few crystals of iodine, or other substances, or by spraying and injecting liquid petrolatum by the ordinary atomizer through the catheter. Chloroform vapor will generally feel cool to a sclerotic tympanum, and so may aid in diagnosis and prognosis. In inveterate cases, Richey's plan of injecting weak silver solutions, followed by iodine vapor, may be cautiously tried. The effect of treatment upon the drumhead should be closely watched, and pneumatic massage by the Siegle speculum can profitably follow in almost all cases.

The treatment described should be repeated before all its good effect is lost, and it should be continued until, in four to six weeks, the duration of the benefit of a treatment ceases to be longer than its predecessor. When this occurs, it should be intermitted, while the patient still continues to use a gargle, and if any backsliding is noted, resume pneumatic massage by the fingertip. A second course of treatment of a few weeks' duration will often do about all that is possible for the restoration of hearing, but a semi-annual return for treatment will test the possibilities of further gain and prevent

loss. The actual increase of hearing thus gained may be small, and yet give the patient many times as much as he had before; it may also check the downward progress of

the affection, and confer an inestimable benefit, as well worthy of our best efforts as many a brilliant success in more favorable fields.

## DISCUSSION.

DR. J. M. BROWN expressed surprise at one omission of Dr. Randall in describing the technic of catheterization. When the beak of the instrument has been slid along the floor of the nasal chamber, and finally rotated into the tube-mouth, ready for the Politzer bag, the thumb and index-finger should hold the catheter, grasping it as nearly lengthwise as possible, while for its better support and retention in proper position, the other three fingers should rest more or less firmly upon the bridge of the patient's nose, so that the patient's head, the physician's hand, and the catheter become like one piece in its entirety; then receding movements will not cause the catheter to slip. When this happens, or there is rude handling of the instrument, the mucous membrane may be broken, and air admitted beneath it into the subcutaneous tissue, and a trouble of an emphysematous character set up. This is extremely distressing, and has caused death in three cases.

DR. L. J. LAUTENBACH said he differed from Dr. Randall upon two points. He invariably insists that the Eustachian tube shall be kept as clean as possible. Before attempting catheterization the patient should exaggerate the act of swallowing, and in that way clear his Eustachian tube. No man has been in practice ten years but who has been visited by patients on whom catheterization had been tried by other physicians repeatedly and sometimes unwisely. It is a very important measure for good if it is correctly used with extreme care; otherwise it had better not be employed. Secondly, he believes that the end of the catheter should be invariably protected by a bulbous end. He cited in instance the complaint of one of his patients that catheterization, as performed on her by another specialist, had been scarcely bearable. This was because the end was sharp and needed protection, which can be easily afforded. Instead of the end being a slightly rounded cross-section of a tube, it has affixed to it, as used by Dr. Lautenbach, a small cone shaped bulb which

fits into the Eustachian openings more accurately than the section of a sphere. Allusion was made by Dr. Randall to variations in the size of the Eustachian opening as an occasional cause of trouble. In this regard Dr. Lautenbach thinks that the bulb used by him is of advantage—since it permits a better study of the contour of the parts, and by slightly withdrawing it the operator may know just where he is. Unless specially instructed the average practitioner should not use the instrument at all, and even the specialist must be very careful. Another aspect presented was the danger of creating a class of patients who will go through life suffering from exaggerated deafness, and attributing their misfortune to "the carelessness" of their physicians. It is admitted by Dr. Lautenbach that this class decreases yearly. He notes advance in otology in accord with that of other departments of medicine. He thinks it presents more difficult problems because people do not attend to disease in their ears in its incipency, but that the otologist could do just as much in his province as other specialists do in theirs, if patients with ear-troubles would seek treatment early in the history of their disease.

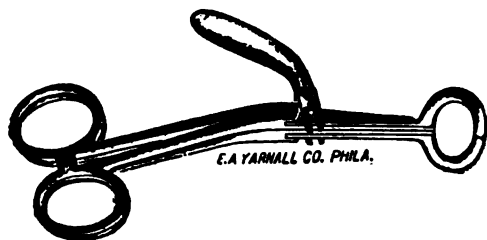
DR. RANDALL closed the discussion, saying he habitually used the catheter with merely a smooth end, and thought most injuries came from instruments improperly made or used. A cone-shaped tip would have a large diameter where it was needless, and a thin-edged end which would be the more apt to wound, because the beak was thicker elsewhere. He had said in his paper that due cleansing of the nares and pharynx was a prerequisite to all inflations. To catheterize the Eustachian tube entails some knowledge of anatomy and tactile sense; but a man having surgical sense ought to be perfectly competent, and should no more hesitate in passing a Eustachian catheter than in entering the more dangerous field of the urethra, as every practitioner must frequently do.

## A NEW FORCEPS FOR INTESTINAL ANASTOMOSIS.

BY ERNEST LAPLACE, M.D.

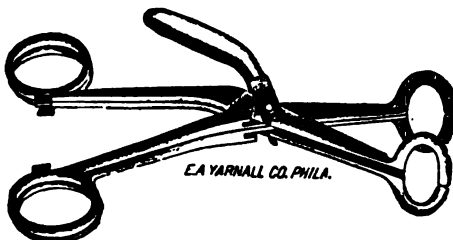
Read November 23, 1898.

THE author gave a demonstration of intestinal anastomosis by a new forceps, a full description of which already appeared in the *Philadelphia Medical Journal*, June 9, 1898. He stated that other appliances used in suturing are unsurgical in so far as they have to be left within the intestine. He thought if some appliance could be devised that would



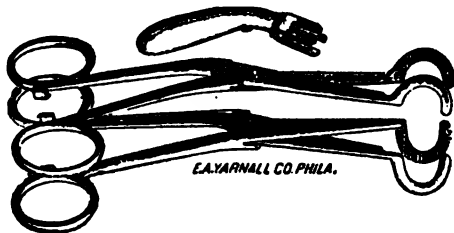
enable very accurate suturing of the intestine, and not leave within it a foreign body, it would be a step forward in surgery. The instrument exhibited by Dr. Laplace consists of two parts which are really hemostatic forceps curved into a semicircle on each side. When held together by means of a clasp, they open as two rings. They are opened within the intestine and serve the same purpose of support that Senn's ring, or any other ring that has been devised, bringing serous membrane to serous membrane. Accurate suturing is the operation of the present. Therefore, if these forceps are within the gut, and sutures are applied, as they would be with the help of Senn's rings, it follows that sutures are introduced all around, except where the forceps penetrate the parts that were sutured. The suturing being done, the forceps are released by loosening the clasps, and then pulling the forceps out of the small opening, first one, then the other, when the operation is finished by a stitch or two. Dr. Laplace has

had five sizes of forceps made to suit different calibers of gut. These forceps will enable the performance not only of end-to-end anastomosis, but also of lateral anastomosis. He first illustrated the efficiency of the forceps by doing a gastro-enterostomy upon some post-mortem viscera, stating that to do the operation only a knife, the forceps, a needle and thread are needed. He did the operation upon a very small stomach, making two openings: one in the stomach, and one in the gut, and, opening the forceps, introduced one blade into the intestine, then put the other blade into the stomach, and held the two blades apart, and then closed them. Thus the cut intestine and stomach were held all around while he sutured. He uses a continuous suture, but any suture may be employed. The forceps have lifting handles made to raise the intestine up, and afford support as well as a broad surface to work with. Having united the stomach and intestine as far as he desired he easily removed the forceps, by removing the clasp, then one forceps was loosened and drawn out with a semicircular motion, and

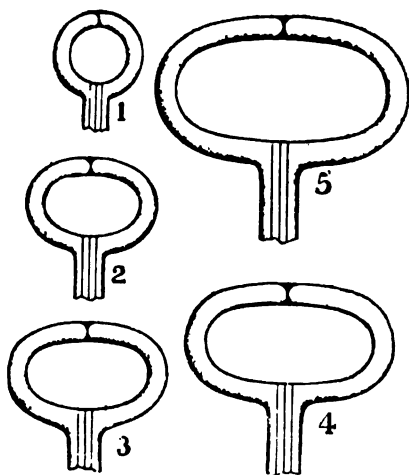


then the other was removed in the same way; finally one more stitch was applied to close the opening through which the forceps were removed. The stitches were much more regular than could possibly have been applied without a support and the support

did no harm to the intestine. Mechanical means were only used to make the manual execution better. He then resected a piece



of intestine and did an end-to-end anastomosis. He stated that in order that the mesentery should be in apposition one must fix these points, and it is not time lost to apply a fixation stitch at the four cardinal points. The forceps are introduced between



two of these stitches, the blades are opened apart so that one penetrates one end, and the other penetrates the other end of the

fixed intestines. The serous surfaces are inverted, or pushed in, and the forceps is clamped. When the forceps is clamped serous membrane is apposed to serous membrane. The sutures are then applied all around the clamped surfaces, to the point where the forceps penetrates the gut. The clamp is removed; one-half of the forceps is loosened and gently drawn out of the gut. The other half is in like manner removed. The operation is completed by adding one or two stitches to close the opening through which the forceps were removed. The caliber of the gut is preserved.

Should it be desired to make an entero-enterostomy with invagination of the ends of the gut, he has devised an instrument to facilitate the invagination and obliterate the end of the gut. It consists of a long, slender, straight hemostatic forceps. The end of the gut is clamped and pressed down within the caliber of the gut; the serous membrane on each side thus rises and is rapidly sutured under the control of the instrument. When



the suturing is done, the instrument is loosened and withdrawn; one more suture is applied at the point where the instrument penetrated. This makes a very good stump, and is very expeditious. The smallest size forceps (No. 1) is used for uniting the gall-bladder with the intestine. The other sizes are for use upon patients of various ages. Aside from numerous operations upon dogs, this method has already been applied to the living, and has been found to answer all requirements.

## DISCUSSION.

DR. J. CHALMERS DaCOSTA, who had previously seen the utility of these forceps demonstrated by Dr. Laplace on the intestines of a cadaver and on those of a living man, said that, to him, the instrument appeared to even greater advantage when used upon the thicker intestine of the living than it did when employed on the thinner intestine of the dead. The expediency of

using a mechanical device in suturing had been largely debated and is still unsettled. The trend of surgical opinion is that whatever disadvantages the use of a mechanical device may possess, it greatly facilitates the application of sutures. The instrument of Dr. Laplace affords all the advantages to be gained from such mechanical devices as the Murphy button, bone-plates, etc., and yet

it is free from their disadvantages, because the operator having enjoyed all the benefit of the forceps removes them, while such devices as the Murphy button must remain in the intestine, and be a cause of anxiety till they have separated and been discharged. A special virtue of the forceps is that they render it easy to place the sutures with mathematical certainty at the required distances. This is so because the rim of the instrument renders it extremely easy to catch the serous coat, and because the suture line not only is held in perfect and firm apposition, but can be kept under perfect control by the handles. The instrument is simple, and, unlike many other devices, may be successful not only in the hands of its originator, but of all who use it. It is destined to replace the mechanical aids of many other methods.

DR. ORVILLE HORWITZ said he had listened with a great deal of pleasure to the instructive demonstration of Dr. Laplace and felt sure that his ingenious instrument will prove to be one of the greatest advances made in intestinal surgery in years. The objection to the catgut ring, bone-plates, bone-bobbins, and similar mechanical devices, is that in their employment much valuable time is consumed and a foreign body is left in the intestinal canal. The Murphy button combines speed with a certain amount of safety; no surgeon who inserts the button is without anxiety until it has been voided through the rectum. The rubber cylinder is a step in advance of either the rings or the bobbins. What Halsted claims for the cylinder is justifiable: the operator can dispense with clamps, the vermicular motion of the bowel is arrested, the adjustment of two ends of intestine, of unequal size, is facilitated, and finally, valuable time is saved by its employment. The objection to the rubber cylinder is that it is a complicated device; often difficult to manage; its proper adjustment frequently requiring a good deal of time. Until the introduction, to the profession, of Laplace's anastomosis forceps, it was superior to any other mechanical contrivance devised to facilitate intestinal anastomosis, with the exception of the Murphy button, which was to be preferred when time was an object. The anastomosis forceps will be found to be superior to the cylinder. The former is not so complicated, is easier of adjustment, and the operation

can be performed with as much speed as in cases where the Murphy button has been used. Personal observation of the practical application of the forceps, in the hands of Dr. Laplace, at the Medico-Chirurgical Hospital, convinced Dr. Horwitz that this instrument is far superior to any contrivance that has been heretofore suggested or employed; and when the profession becomes familiar with the instrument, it will supersede any form of mechanical device at present employed in intestinal surgery.

DR. EDWARD MARTIN greeted the forceps as an admirable mechanical device that will improve intestinal technic. He applauded the modest manner in which Dr. Laplace had presented his instrument and predicted that since it had done so well on the dead it would be much more efficient when used upon the living. It facilitates the operation, it expedites it, and finally makes the sutures very much more accurate. Moreover, the forceps are simple in construction. Yet facility in handling them should be thoroughly acquired, as the management of any new instrument should be, before employing it on a patient. This experience may be gained on the dog, but is preferably obtained upon the intestines of the recently dead. The technic of this instrument can be acquired much more rapidly than that of the ordinary intestinal suture, and an added advantage not mentioned by Dr. Laplace is that the metal instrument will guide the surgeon in suturing. Improvements short of being revolutionary in the field of surgical appliances rarely have a widespread adoption. This is to be deprecated, and while Dr. Laplace does not claim for this instrument any revolutionizing power, still anyone who has attempted suturing through a thick abdominal wall with a short mesentery will probably supply himself with this forceps.

DR. HEARN expressed his belief that surgeons who opposed mechanical aid in intestinal anastomosis will be glad to use Dr. Laplace's forceps. He advocates the use of the Murphy button where hurry is imperative to combat shock or long exposure, but recognizes that the sequences of the Murphy button are sometimes unpleasant, *e. g.*, sloughing. Dr. Laplace's instrument is ideal.

DR. A. J. DOWNES was impressed by the ease with which Dr. Laplace used the for-

ceps. He said that intestinal anastomosis only attained success with the advent of the Murphy button, the objections to which are well-known. From experimentation on animals, Dr. Downes was convinced, until very recently, that the ideal method of doing anastomosis was by the use of inflatable rubber bulbs or cylinders. But seeing Dr. Laplace use his forceps at a private demonstration about two weeks before, he thought that forceps on this principle would prove the instrument of the future. He considered the instrument as devised by Dr. Laplace too complicated and had a simpler one made. Dr. Laplace's forceps is formed of two complete forceps, the bowel blades of each forming half a circle, or half an ellipse, the two locked together forming the bowel blades, circular for end-to-end union, elliptical for side-to-side union. His forceps contain five separable parts. Dr. Downes' instrument for end-to-end anastomosis is a single-locking forceps, the bowel blade end forming a fenestrated circle with a very small segment left open for the easy withdrawal after use. The blade for the side-to-side union forms an unbroken fenestrated ellipse, removable from half an inch of unsutured bowel. These forceps are introduced practically as by Dr. Laplace. Their removal is simpler. In removing the end-to-end forceps, the bowel, after suture, rolls into the hollow of the blades through the small open segment as the blades roll out of the bowel. Rotation of a quarter of a circle in the line of suture removes the forceps, after which one suture may close the bowel. In the side-to-side union Dr. Downes leaves half an inch unsutured, removes forceps by direct traction, and completes his suture. These simplified forceps owe their birth to having seen Dr. Laplace use his. No originality is claimed, other than the reduction to simplicity of what should prove a valuable, practical, and rapid method in anastomosis.

DR. RODMAN, who had seen several demonstrations by Dr. Laplace of his forceps, had been each time most favorably impressed by the instrument. Like Dr. DaCosta, he thought it the best of the mechanical aids that have been used in intestinal work, and predicted that it will displace all others. It is not quite so rapid a method as that of the Murphy button, but is free from the latter's many objections. Use of these forceps will not be attended by the same danger of

pressure necrosis, of leaking from an intestine, of septic peritonitis, of intestinal obstruction, and of the lodgment of a foreign body in the stomach as has been reported by Willy Meyer and many others who have used the button, and therefore the Laplace is an ideal method.

DR. M. PRICE pronounced the instrument perfect in its accomplishment of anastomosis, and said it would displace other devices. Although the Murphy button is the most rapid method, it cannot be any more accurate than the Laplace forceps, and has an exceedingly dangerous complication when a small intestine is fastened by it to the stomach, because there are two ends to the intestine, into either one of which the button may drop. If the case is cancerous, or of a similar character, a button that has gone the wrong way will stay and ulcerate, and the complication ends the patient's life. This is also true in the anastomosis of a small intestine to a large one, in order to switch off a cancerous portion, and complete the lumen of the bowel. The forceps fulfils the indications in another way, and is absolutely clean. No matter how expert an assistant, it is almost impossible in performing intestinal anastomosis by former methods to keep feces and gas from extravasating. The forceps keep the parts clean, and also in apposition throughout the suturing, which it much facilitates. End-to-end union in bowel of the same caliber it accomplishes with perfect ease, but that is not the kind of bowel usually met by Dr. Price. His experience includes 12 cases of obstruction of the bowel from cancer. He has seen a colon, larger than his arm, contracted in another portion to the size of his thumb. This case was operated upon a week before Dr. Abbe read his paper upon intestinal anastomosis. When an attempt was made to close the artificial anus established, the spur was cut away. But as union did not result, the bowel was torn loose from its adhesions to the abdominal wall, and was closed in with two rings, one large ring being put at the center of the spur. The bowel was replaced, and the result was perfect. The woman lived four years, and then died of cancer. In anastomosis, the instrument of Dr. Laplace will be of great help; with a little ingenuity, it should meet all the complications to be dealt with. It is, probably, the best mechanical appliance yet seen in intestinal surgery.



DR. LAPLACE expressed his thanks to the critics for their kind opinions of his instrument and said that if it deserves one-half of what had been said he would be very well satisfied with it. The instrument shown by Dr. Downes was similar to one manufactured for Dr. Laplace about a year and a half ago. Dr. McKenna called the attention of Dr. Laplace to such an instrument, suggesting that it would be as serviceable, but far simpler. Experience proved the

contrary. In reply to the objection of Dr. Price that the instrument may be less efficient in uniting the small gut to a possibly large gut, Dr. Laplace said if any difficulty arose the blame should attach to the operator rather than to the instrument, and, moreover, the method of lateral anastomosis with invagination of the ends of the gut could always be employed, which had been shown to be well controlled by the instrument.

## CONTAGION, ITS MEANING AND ITS LIMITATIONS.

BY LAWRENCE FLICK, M.D.

Read December 14, 1898.

THERE is perhaps no question in medicine upon which the profession is so much at sea as that of contagion. There has been so much quibbling about the meaning of the word contagious and so many hairsplitting distinctions made between it and the word infectious that the general reader of medical literature has become bewildered and is really at a loss to know, when he encounters the words, what is actually meant by them. It may be well, therefore, to again take soundings upon the entire subject and to seek the channels of thought which can be used by all of us so as to again bring our observations within reach of common intelligence.

The word contagion is derived from the Latin word *contingere*, which means to be in contact with, to touch. As applied to disease it conveys the idea of communicability from one person to another, from a human being to an animal, from an animal to a human being, or from one animal to another, by contact, without an intermediate agency or host. The Century Dictionary defines it as follows:—"First, infectious contact or communication; specifically and commonly the communication of disease from one person or brute to another. A distinction between contagion and infection is sometimes adopted, the former being limited to the transmission of a disease by actual contact of the diseased part with a healthy absorbant or abraded surface, and the latter to transmission through the atmosphere by floating germs or miasmata. There are, however, cases of transmission which do not fall under either of these divisions, and there are some which fall under both. In common use no precise discrimination of the words is attempted." Webster, in defining the word contagion, quotes from Dunglison as follows:

"The act or process of transmitting a disease from one person to another by direct or indirect contact." For a second definition he gives: "That which serves as a medium or agency to transmit disease; pestilential influence." In illustration of this meaning he quotes from Shakespeare the following lines: "And will he steal out of his wholesome bed to dare the vile contagion of the night." In his definition of the word contagious he says: "First (Med.) Communicable by contact; catching; as a contagious disease; second, containing or generating contagion; pestilential; as, contagious air; third, spreading or communicable from one to another." Under synonyms he says: "Contagious, infectious. These words have been used in very diverse senses; but in general a contagious disease has been considered as one which is caught from another by contact, by the breath, by bodily effluvia and so on; while an infectious disease supposes some entirely different cause acting by a hidden influence, like the miasma of prison ships, of marshes and so on, infecting the system with disease. This distinction, though not universally admitted by medical men as to the literal meaning of the words, certainly applies to them in their figurative use. Thus we speak of the contagious influence of evil associates; the contagion of bad example; the contagion of fear, and so on, when we refer to transmission by proximity or contact. On the other hand, we speak of infection by bad principles and so on, when we consider anything as diffused abroad by some hidden influence." Gould, in his Medical Dictionary, defines contagion as "the process by which a specific disease is communicated between persons either by direct contact or by means of an intermediate agent." Infection he defines as "the communication of disease germs or virus by

any means, direct or indirect." Thomas' Medical Dictionary gives the definition of contagion as "the communication of a disease by contact or by inhaling the effluvia from one already affected; often used as synonymous with infection." Infection he defines as "The communication of a disease by personal contact with the sick or by means of effluvia arising from the body of the sick, contagion. The transmission of disease from one individual to another of a different class. The term is sometimes used as synonymous with the contagion or agent by which a communicable disease is conveyed." The word infectious he defines as "contagious; corrupting; that may be easily communicated; capable of transmission from one person to another by contact or by being conveyed through the atmosphere." The word contagious he defines as "A term applied to diseases which are spread by contagion or communicated." In Dunglison's Medical Dictionary the word contagion is defined as "Transmission of a disease from one person to another by direct or indirect contact. Also at one time applied to the action of miasmata arising from dead animal and vegetable matter, bogs, fens, etc. Contagious diseases are produced either by virus or contagion capable of causing them by inoculation as in smallpox, cowpox, hydrophobia, syphilis, etc., or by miasmata proceeding from a sick individual as in plague, typhus gravior, measles, etc. Contagion and infection are generally esteemed synonymous. Frequently, however, the former is applied to diseases not produced by contact, as measles, etc., while infection is used for those that require positive contact as itch, syphilis, etc. Diseases which are only produced by contagion are said to have their origin in specific contagion, as smallpox, cowpox, syphilis, etc. Those produced by contagion and yet supposed to be sometimes owing to other causes, are said to arise from common contagion, as typhus, cynanche protidea, etc." The definitions given in the dictionaries are somewhat obscure and all savor of old-time ideas about the etiology of disease. All, however, agree on certain points, namely: First that the word contagion has a broader meaning than the word infection; and secondly that the words contagion and infection may be used synonymously. In current literature we frequently find the position of the two words reversed and a limited mean-

ing given to the word contagion and a broad meaning to the word infection.

The word infection is derived from the two Latin words *in* and *facere*, which mean to carry in something, to make in something. As originally applied the word meant the carrying of disease from one person to another by a force extraneous to both the disease and the persons giving and receiving the disease. It was principally used to convey the thought that diseases which had their source in miasmatic conditions were wafted by the air and thus communicated to all persons breathing that air, for example, as malaria was carried by the wind from swamps. It had a shade of meaning which well suited certain diseases to which the word contagious could not properly be applied.

In the light of the germ-theory of disease we are in a much better position to formulate a clear-cut idea of what is meant by contagion, and wherein contagion differs from infection. We see by it that the key to the true application of the two words is really to be found in their literal meaning and original application. In the adjective form, other synonyms of contagion are: Communicable and catching. Communicable and catching are generic terms, and convey the broad idea of communicability without any modification as to method or process by which the end is accomplished. Contagion and infection are specific terms, and convey modified ideas of communicability, each peculiar to itself. Contagion conveys the idea of communicability by contact, direct or indirect; the chain of communication between the person having the disease and the person receiving it being unbroken. Infection conveys the idea of communicability through an intermediate agency outside of both the person who has the disease and the person to whom the disease is conveyed. The essential features of a contagious disease are:

(1) A living organism, the parasitic existence of which in a human being or animal creates a disease.

(2) The communicability of that organism from one human being to another, from a human being to an animal, from an animal to a human being, or from one animal to another.

(3) Immediate or mediate contact between a person or animal suffering from

the disease and a person or animal free from it.

(4) A limited environment, under which communicability is operative.

The essential features of an infectious disease are:

(1) A living organism, the parasitic existence of which in a human being or animal creates a disease.

(2) The communicability of that organism to human beings and animals.

(3) An intermediate agency, through which communicability between two hosts, or from a non-parasitic habitat to a host, can be established.

The difference between the ideas of contagion and infection is:

(1) That, in contagion, the chain of contact between the person giving off the disease and the person receiving it must be complete and unbroken, whilst in infection the chain of contact may be broken by an intermediate agency, or host.

(2) That, in contagion, the environment, under which communicability is operative, is limited, whilst in infection the environment, under which communicability is operative, is general.

It is true that, in contagion, the contact may be mediate, that is, through fomites, and that fomites in a sense constitute an intermediate agency; but fomites differ on important points from the intermediate agency of infection. The intermediate agencies of infection usually are earth, air, and water. Fomites cannot become a soil for the reproduction of organisms which produce contagious diseases, and have no inherent power of transferring them from one host to another. They can only give them shelter until some extraneous force conveys them into the proximity of a prospective host, or until chance brings such a host into their vicinity. The intermediate agency of infection, on the other hand, can become a soil for the reproduction of the organisms which produce infectious diseases, and may possess inherent forces with which to convey such organisms to prospective hosts.

In the category of contagious diseases I would place smallpox, measles, scarlet fever, roseola, influenza, colds of various kinds, tonsillitis, chickenpox, whooping-cough, mumps, typhus fever, diphtheria, plague, tuberculosis, leprosy, syphilis, erysipelas, glanders, gonorrhea, septicemia, parasitic skin diseases and contagious conjunctivitis.

In the category of infectious diseases I would place cholera, typhoid fever, the malarial fevers, yellow fever, dengue, tetanus, and, possibly, pneumonia and cancer.

That all of the diseases here enumerated are communicable can scarcely be doubted in the present light of medical science. It has not yet been demonstrated, in all, that a living organism is the active and essential cause, but we can deduce by analogy from those in which a living organism has been found to be the active cause to those in which no organism has as yet been identified as the active cause, that a living organism must be the active and essential cause in all. Smallpox, measles, scarlet fever, roseola, chickenpox, whooping-cough, mumps, typhus fever, diphtheria, plague, syphilis, erysipelas, glanders, gonorrhea, septicemia, parasitic skin diseases, contagious conjunctivitis, cholera, typhoid fever, yellow fever and dengue are admittedly communicable, upon clinical evidence alone. In tuberculosis, diphtheria, erysipelas, gonorrhea, septicemia, cholera and typhoid fever, the organism which produces these diseases has undoubtedly been identified. A living organism as an active cause having been discovered in these, some of which are admittedly contagious, it may be logically assumed that a similar living organism as an active cause must exist in the others. Like causes produce like effects, and like effects must have like causes. Pursuing this line of thought to its logical conclusion we arrive at the proposition that communicability is predicated upon life, and that all diseases which are found to be due to living organisms are consequently communicable. What can thus be reasoned out has already been worked out in all detail in the laboratory. In diphtheria and tuberculosis not only have the organisms which produce these diseases been discovered, but every step in the process of communicability has been demonstrated. In one of these, diphtheria, the clinical evidence has been in favor of communicability; in the other, tuberculosis, the clinical evidence, as usually interpreted, has generally been against communicability. In both, however, the same fundamental law has been found to exist: namely, that they are due to living organisms, and that those organisms are communicated from one host to another under certain well-fixed laws and conditions. It is from the knowledge that we have gath-

ered about tuberculosis and other diseases in the laboratory, together with the clinical knowledge that we possess about these and other diseases, that we are justified in placing diseases in the category of communicable diseases which have not yet been demonstrated to belong there, either at the bedside or in the laboratory.

Into which category a communicable disease should be placed, whether that of contagious or infectious, must for the present remain, to a very great degree, a matter of conjecture. When the organisms which produce the different diseases have all been identified, and their life-histories studied, it can be done with mathematical accuracy. For the present, the order in which I have placed them seems to me to correctly represent our knowledge about them as gleaned at the bedside and in the laboratory. Smallpox is a typically contagious disease; malarial fevers are typical infectious diseases. Between these there are shadings in both directions. If we bear in mind, however, the essential features of contagion and infection, and the essential difference between them, as shown us by the typical diseases representing them, we can not go far astray in placing all communicable diseases where they belong. I have placed pneumonia and cancer among the infectious diseases rather than among the contagious, for the reason that the environment under which communicability is operative seems to be general instead of circumscribed. When pneumonia is prevalent in a community it seems to strike down people in all quarters irrespective of contact; and cancer seems to be distributed evenly among all classes and in all parts of a community.

A most important point in the question of contagion is that of limitation. Whilst there are certain laws to which all contagious diseases subscribe, every contagious disease has laws to which it alone is amenable. These laws are dependent upon the idiosyncrasies of the organisms producing the diseases, and upon the soil which the organisms require for their development and the completion of their cycles of life. For example, whilst smallpox and tuberculosis are both contagious diseases, and subscribe in all points to the essential features of a contagious disease, they differ very materially in the intensity of their contagion. The organism which produces smallpox finds a congenial soil

very readily, runs through the cycle of life very quickly, and exhausts the soil upon which it feeds in a very brief period of time. The organism which produces tuberculosis is implanted with considerable difficulty, runs through its cycle of life more slowly, and exhausts the soil upon which it feeds most tardily. The organism which produces smallpox escapes from its host almost immediately after the development of the disease, and goes out in profuse numbers from every part of the body, whilst the organism which produces tuberculosis does not escape from its host until the disease has been in progress for a long time, and escapes by a single avenue. In smallpox the deciduous organism is at once set free in the atmosphere surrounding the host, polluting it, and making it intensely infectious, whilst in tuberculosis the deciduous organism is protected by broken-down tissue, with which it has to be carried into the new host, and, therefore, cannot pollute the atmosphere around the host to a very intense degree. The difference in the intensity of contagion between smallpox and tuberculosis is, therefore, very great, and the phenomena by which contagion manifests itself are very different. The essential features of a contagious disease, however, exist in both, and are identically the same. In both we have a living organism, the parasitic existence of which produces the disease; in both we have communicability of that organism; in both contact, direct or indirect, is essential to communicability; and in both, the environment under which communicability is operative is limited.

What is true of smallpox and tuberculosis in regard to the individuality of contagion is true of all communicable diseases. Certain groups resemble each other closely, but even in such groups individual members have marked peculiarities. The exanthemata resemble each other closely, all being intense in their contagion and running rapid courses. Leprosy resembles tuberculosis; there is a similarity between the acute diseases of the upper air-passages; and there is a very close resemblance in the mode of distribution of some of the infectious diseases. As a rule the intensity of contagion or infection is in proportion to the profuseness with which the organism is given off from a host, and the degree to which the deciduous organism is encumbered in its in-

gress into a new host. Where the deciduous organism is given off through a single channel and is embodied in broken-down tissue or newly developed tissue, contagion is apt to be mild and erratic.

For preventive purposes a correct classification of communicable diseases, and a careful study of the idiosyncrasies of each disease are of great importance. With contagious diseases the most important factors to be considered are the host and the prospective host; whilst in infectious diseases the most important factor is the intermediate agency of communication. In contagious diseases, we should seek to make the host sterile and the prospective host immune; in infectious diseases we should seek to make the intermediate agency sterile. For example, in smallpox and tuberculosis we have to do first with the person suffering from the diseases and second with the persons who may be exposed to the disease; whilst with cholera and typhoid fever we can accomplish most by looking after the water and food supply or after the drainage of our habitations. With all contagious diseases the prospective host is as important a factor from a preventive point of view as the host himself. With smallpox, immunity can be established by vaccination, and there is promise in the laboratory work of the future that similar results may be obtained with all the intensely contagious diseases. With tuberculosis and some of the more mildly contagious diseases partial immunity can be established by a maintenance of a healthy

nutrition. Could all the hosts of contagious diseases be made sterile or isolated so effectively as to make contact impossible, no new set of hosts could come into existence. In practical life such a condition of things is impossible of attainment; and it therefore becomes most important to work at the other end of the line and reduce the number of available hosts to a minimum. With infectious diseases isolation is futile, except in so far as it will aid in preventing the infection of the intermediate agency of distribution. If every typhoid-fever patient could be isolated and his discharges sterilized a time would come when all water-supplies would likewise become sterile, and the germs producing the disease would no longer be distributed. Better results can, however, be attained by at once sterilizing all water-supplies.

In order to be able to fully understand the subject of contagion one must first learn to realize that it is a complex one. With a single idea based upon what can be observed in smallpox and other intensely contagious diseases, one is bound to become stranded in studying the subject. It is a great and an important subject, and we are as yet merely at its threshold. To gain access to all the secrets which it will reveal to us will require long and tedious study in the laboratory and careful conscientious observations at the bedside, with a mind unfettered by traditions and receptive to new ideas. What we know gives us a good hypothetical basis; what we have yet to learn will give us mathematical accuracy.

## DISCUSSION.

DR. A. A. ESHNER said that any one who has given any consideration to these two terms, infection and contagion, must have encountered a good many of the doubts referred to by Dr. Flick. Dr. Eshner holds quite the opposite view to that enunciated by Dr. Flick, and believes it to be the current one. Contagion is regarded by Dr. Eshner, as stated by Dr. Flick, to be the transmission of disease by more or less immediate contact, thus restricting the channels through which the transmission takes place; while Dr. Eshner gives the larger relation to the word "infection" as applicable to the transmission of disease through what-

ever channel, through earth, air, water, through individuals. He thinks this helps us to express ourselves more clearly. If, as suggested by Dr. Flick, contagion is used as the larger, the more comprehensive word, it seems to leave unexpressed the idea of general transmissibility. The word contagion must be restricted to transmission by contact on account of both its derivation and its use. The use of the term infection should cover the whole ground of transmission, to express transmissibility through whatever channel, and it will, therefore, include the lesser transmissibility, viz., through contact more or less direct. As Dr. Flick says,

these distinctions are refinements and often only hair-splitting ones. When transmission through more or less direct contact is mentioned a good deal more may be meant than superficially appears. Immediate contact includes diseases like syphilis, gonorrhea, leprosy. These are types of disease that seem to be transmitted by direct contact. There are others, which, as Dr. Flick says, are known to be more positively or virulently contagious, which are transmitted by mere association of the sick with the well, by less intimate contact, through the intermediation of the air. Dr. Flick has gone a step further and has included in one of his groups parasitic, cutaneous and intestinal diseases. He speaks at least of parasitic skin-diseases, and if he includes those it will be equally fair to include also parasitic intestinal diseases. These it will be best to place in a class of their own, because of the life-history of the causative parasites and their mode of conveyance, and Dr. Eshner approves the term of the Germans, "invasion-diseases," as applicable to the parasitic cutaneous and intestinal diseases. He made a plea, for the sake of clearness of expression and of uniformity of usage, that some one term be agreed upon for diseases that are transmissible. From his point of view it seems easier to describe the transmissible diseases as infectious, and, if one cares to make a sub-group (and he is doubtful about the wisdom of that, the distinctions are sometimes so elusive), to consider some of these infectious diseases as contagious. In this connection it is to be borne in mind that the transmissibility of diseases from person to person or from animal to animal depends upon the peculiarity that the bacteriologists designate obligate parasitism. A disease will be transmitted from individual to individual if the bacterium on whose activity it depends is incapable of saprophytic existence (on dead matter, outside the animal body), if it is an essential and obligate parasite; while on the other hand there are diseases that are dependent upon the activity of so-called facultative saprophytes, diseases whose causative organisms are capable of existence and multiplication outside the body; for instance, the group of diseases including tetanus, malignant edema, and pyogenic infections. These are usually not transmitted from individual to individual, though in the laboratory they

could be so transmitted; and even obligate parasites are susceptible of cultivation on artificial media. They are types of diseases that certainly could not be logically designated contagious, but which would fall better into the larger category of infectious diseases.

DR. S. SOLIS-COHEN said that Dr. Eshner's position seemed well taken; that it would be better to speak of all communicable diseases as infectious, and then to make a subdivision including only those diseases which in common language are called "catching." This would be useful, first, because of clarity of expression in scientific work, and secondly, in popular expositions of the subject. Infection has come to mean a definite process of disease-production; one, namely, in which the exciting cause reproduces itself within the affected organism. This is the case with tuberculosis; it is the case with syphilis, with smallpox; it is the case with all the diseases mentioned by Dr. Flick. Although he classes some as contagious and others as infectious, all present the distinctive and common characteristic that the living, exciting cause reproduces itself within the host. We find, however, that among these diseases we can make two distinct classes. As in all things, we find some cases naturally on the border-line; in nature there is no sharp distinction; yet, taking the extremes Dr. Flick has cited, malaria and smallpox, the difference in the method of transmission is at once evident. When a patient says to the physician, "Is the disease catching or contagious?" he means, does it infect one brought within the vicinity of the patient, as does smallpox. Practically he asks, "Can I catch the disease by nursing this patient, if I am unprotected by vaccination or previous attack?" As to malaria, Dr. Flick would unhesitatingly answer, "No, this is not catching;" as to smallpox he would say, "Yes." As to typhoid fever, he would say "No;" as to tuberculosis he would say, "It is not catching, provided you take proper care of the sputa." Tuberculosis, which Dr. Flick classes as contagious, is not "catching" in the ordinary sense; it cannot be contracted merely by sitting in the same room with a patient, as can smallpox or varicella, and to call it contagious is to give a false idea of the manner of its transmission and to excite an unnecessary apprehension among the relatives and friends of the sick. We can answer more definitely

the queries which are addressed to us as to whether a disease is or is not contagious, if we confine the term to those infectious diseases which may be "caught" by coming within the vicinity of the patient, in which the air alone is able to and does carry the agent of infection from one host to another host; and then we have the other group of infectious diseases which are not contagious. Examples of the group of infectious diseases which are contagious, are diphtheria, smallpox, scarlatina, measles; examples of the group of infectious diseases not contagious, are syphilis, typhoid fever, tuberculosis, and malaria.

DR. FLICK closed the discussion, saying, there is no human agency that can stop the manufacture of new words, or the giving of new meanings to old words, and it may be that the relative meaning of the words contagion and infection is being changed. If it is desirable to retain the old literature and the meaning which the formation of the words gives them, the definitions which he laid down must be accepted. The tendency in modern times is to give a more restricted meaning to the word contagion, but

some continue to use it as the older writers used it, and obscurity is the result. He cannot agree with those gentlemen who hold that it would be better to adopt the new method, and give infection the broad meaning, and contagion the narrow meaning. Infectious diseases have peculiarities of their own, and must, therefore, form a subdivision. They cannot form a class, as a class must include all subdivisions. For example, in malaria, the organism producing the disease may have two states and two hosts to complete its cycle of life, whilst, in smallpox, the organism producing the disease has but one, and goes direct from one person to another. In practical life, in the matter of prevention of disease, this is an important distinction, because the method which is necessary for the prevention of a disease must depend entirely upon whether the organism producing the disease can have and maintain an existence, and go through a cycle of life outside of the human host.

Moreover, in the change of the meaning of the two words, all the literature is lost that has gone before, and there is some excellent literature upon the subject.



## APHASIA FROM AN UNUSUAL CAUSE.

BY A. FERREE WITMER, M.D.

Read December 14, 1898.

By aphasia was originally meant an inability to express thought in words. In 1861 Broca called attention to well defined softening of the brain in two patients who had been aphasic. This softening was located in the posterior part of the third frontal convolution on the left side. Although Broca contended that the position on the left side was probably accidental, further reports indicate that aphasia follows disorganization on that side far more frequently than on the right; according to Sequin in 88 per cent. of cases, which is approximately the ratio of right- to left-handed people. As the knowledge of the interdependence of the brain-parts grew it was seen that the area of the brain limited to the convolution of Broca was frequently not the only part involved, but that other and more distant parts were correlated in the function of intelligent speech. Thus grew up the conception of the zone of language comprising (1) Broca's convolution, lesion of which causes inability to remember movements necessary for articulation, (2) the superior temporal convolution, lesion of which causes inability to understand spoken words, and (3) the angular convolution, lesion of which causes inability to interpret words that can be seen. These three collections of cells, or centers, are connected by fibers known as associative tracts. It will be seen, therefore, that the subject of aphasia can be conveniently studied under five headings:

(1) True aphasia, (2) motor aphasia, (3) sensory aphasia, (4) associative, and (5) combined conditions. True or intellectual aphasia would follow upon a lesion in any one of the three areas already outlined. It has been proposed to call this form of aphasia *apperception*.<sup>1</sup> By this term is meant the

combination of central excitation with any incoming sensory stimulation before that stimulation arouses such excitation in the cerebral cortex as to bring into consciousness a complete perception. A more descriptive term for lesion in any of these three brain-areas would, in the writer's opinion, be central aphasia.

This central form of aphasia holds a median position between the cephalad fibers known as sensory tracts and those caudad known as motor tracts.

When all three of these brain-areas are involved the condition is called complete aphasia. Associative aphasia results from the disturbance of connection between the parts comprising the central structures.

Combined aphasia is, as its name suggests, two or more of the above forms in one individual. Let us now determine the form of aphasia in our patient.

You will notice that he correctly interprets the sounds that he hears, that he reads understandingly, and that muscle-movements, although stiffly, are correctly performed. We can, therefore, exclude the superior temporal, the angular, and Broca's convolutions from participation in the lesions. Dependent upon the associative tract involved, different terms are employed to express the disturbed function; thus when the tract between the auditory area and Broca's convolution is disorganized the condition is spoken of as *paraphasia*, etc. But time will not permit me to go fully into this now. Suffice it to say that as the patient readily and correctly coordinates the different centers forming the zone of language, we can exclude a lesion of the associative tracts. You will, I think, agree that the patient attempts to speak when directed, i.e., the sensory tract is intact.

But you have also noticed that his attempts to speak are frequently abortive. It would seem therefore that we are dealing with a condition known properly as motor aphasia. The history of this patient until his eighth year was uneventful; from that time, however, without apparent cause, he was seized with convulsions of the grand-mal type, which recurred at monthly intervals until last January, when he went into status and remained unconscious for three hours. On the following day the entire right side was found to be paralyzed and speech lost. Improvement since then has been slow but continuous, the face, trunk, leg, arm, and speech improving in the order named. The site of the lesion is doubtless in that part of the brain most frequently involved in cerebral hemorrhage, the knee and posterior limb of the internal capsule. (Charts.) Since January the boy has had but one convulsion, the movements in which were generalized. Examination of the heart is negative; there is no history of luetic infection; knee, elbow and wrist-jerks in the right accentuated. Inquiry into the family history on the maternal side gives a line of goitrous ancestors, the mother and grandmother of the patient being afflicted with this affection. On the paternal side we find a grandfather who became insane at about the middle of life. It is highly probable, therefore, that the boy has inherited an unstable nervous system, which at the time of puberty and under the additional stress of a series of convulsive seizures, gave way.

Paresis following chorea, the so-called

chorea mollis, is well known. Aphasia in the course of or as a sequel to protracted febrile states is not uncommon. Henoch, quoted by Griffith,<sup>2</sup> noted complete aphasia in 6 per cent. of his cases of typhoid fever in children and partial aphasia in many more. Continued hemiparesis from status epilepticus, however, is apparently very uncommon. Recently, Pierce Clark, of the Craig Colony for Epileptics, has reported a case of hemorrhage beneath the skin of the face in a patient following each convulsive outbreak.<sup>3</sup> By the kindness of Dr. Clark I am enabled to show you the photograph of this patient. Dr. Robertson has called my attention to a case similar to mine, reported by an Englishman some years ago, and states that he also has a case of like nature in his own practice. With these exceptions, I am unacquainted with any literature on the subject. In closing, I would like to call your attention to an interesting but usual feature in hemiparesis exceedingly well shown in this boy, i. e., the marked overaction of the flexor group of muscles on the parietic side. There is reason to believe that the extensors are innervated from the brain, and the flexors from the cord. Were the patient able to properly inhibit the flexor activity, I am confident that the recovery would be more prompt. Along this line the treatment is being conducted.

#### REFERENCES.

- <sup>1</sup> Faculty of Speech, by Joseph Collins, 1898.
- <sup>2</sup> *Philadelphia Medical Journal*, Oct. 15, 1898.
- <sup>3</sup> *New York Medical Record*, liii, 445.

#### DISCUSSION.

DR. F. SAVARY PEARCE said he did not catch from the speaker's paper whether the case was one of complete motor aphasia (aphemia) or not. At all events a motor aphasia was present in a case of right hemiplegia, which would signify a lesion involving the Rolandic region.

The old theory has been that the flexor contraction is always greater than that of the extensors in any palsied member because the muscles are stronger in the flexor than in the extensor group, and which in health are controlled by volition. Dr. Wit-

mer's theory as to flexure contraction is interesting.

DR. J. MADISON TAYLOR did not clearly understand the unusual cause of the aphasia, and inquired how it arose.

DR. WITMER, in answer to the inquiry by Dr. Taylor, stated that in the course of the paper it had been said that the boy's heart was normal, that there was, no syphilitic taint in the family history, but that there was a decided neurotic taint and the paresis resulted from a probable disturbance of the end-brushes in the cerebrum

causing retraction at that point and consequent loss of function. It is known that hemiplegia may follow upon an epileptic convulsion, but usually it is very transient. In this case the hemi-paresis had been noted since the latter part of January. At first it was complete, and was without question a hemiplegia. The unusual condition in this case was the long continuance of the one-sided weakness, suggesting a hemorrhage consequent upon the excessive cerebral activity.

Another interesting feature in the case, a not unusual one, is the overaction of the

flexor group. The reason that the flexor group is unduly active in diseased states of this type is probably because the flexor group is first developed and therefore less readily disturbed. In diseases of the brain we find hallucinations of hearing exceedingly common. In the ontogenetic development of man it is of interest to recall that the centers for smell are first, and those for hearing last, developed. It would seem that the overaction of the flexors is of a similar nature to that noted in these disordered brain states.

## THE BOTTINI OPERATION FOR ENLARGEMENT OF THE PROSTATE GLAND, WITH REPORT OF A CASE.

BY ANDREW J. DOWNES, A.M., M.D.

Read December 14, 1898.

THE most distressing affection incident to advanced years in the male is enlargement of the prostate gland, not in itself so much as in its results. Until the aseptic era in surgery there were few exceptions to the rule that prostatitis suffered also very soon from cystitis, and in not a small percentage of cases the infection traveled up the ureters. Even to-day it is exceptional to be able to teach a man to so carefully use his catheter as to escape infection. The mortality-rate is very much enhanced in old men by the secondary results of enlargement of the prostate gland.

What has surgery usually offered these cases? Prostatectomy, orchidectomy and vasectomy. The last two, almost minor operations, easily possible of being done aseptically, have a considerable mortality-rate with only a moderate percentage of cures of the condition for which the operation is undergone. They are not radical operations. Orchidectomy has now few advocates. Patients naturally take unkindly to it. Vasectomy is still slower and more uncertain as to after-results. At best these operations are surgical makeshifts, exceedingly well intended and apparently scientifically proven, but which have not fulfilled expectations and which, like oöphorectomy as a cure for fibroids of the uterus, will disappear in disuse. Prostatectomy has always had a high mortality. The latest radical method by the combined suprapubic and perineal incisions with, if possible, complete enucleation, has lately gained many advocates, but they ask for earlier operation. Surely if this operation is to give good results it must be done before the development of cystitis or before the use of the habitual

catheter. How many patients will submit? Very many cases, as met with now, are beyond where good judgment can allow the use of general anesthesia. The above is old knowledge boiled down and rewritten. It indicates why catheter-life, so-called, has been allowed. Conscientious surgeons have become accustomed to telling these patients that for them surgery is a "dernier ressort," and it might always have been so but for the galvano-cautery operation of Bottini.

In October, 1875, Prof. Bottini, of Pavia, Italy, first made use of an instrument called the "cauterizzatore prostatico," by which he cauterized crudely, as it would appear now, the prostatic urethra and prostate sufficiently and, if necessary, repeatedly to remove the obstruction to the outflow of urine. Fifty-seven cases so treated had a mortality of 2, with otherwise quite successful results. He then began to use an improved instrument called the "incisore prostatico," an instrument of precision, with the introduction and use of which the Bottini galvanic cautery radical operation for the cure of prostatic hypertrophy and its results established itself as one of the most conservative and successful operations in surgery. A. Freudenberg, of Berlin, one of the first to use and to recognize the great usefulness of the Bottini incisor, soon improved the instrument, giving it a better cautery-blade, a better handle, and rendering it easier of sterilization. Among the first to admit these apparently simple yet most necessary modifications was Bottini himself, who generously gave preference to and is now using the Freudenberg modification of the Bottini incisor. The instrument consists essentially of a grooved shaft ending in a beak. From the beak

forward and back an iridino platinum cautery knife plays in a groove; its movement is controlled by a turn-screw. At the proximal end of the shaft is a barrel-shaped handle, from the distal end of which, running up through the shaft around the beak and returning on the other side of the groove to the handle again, is an aqueduct, through which it is possible to let ice-water run, thereby keeping the handle, shaft and beak cold, even when the blade is white hot. It is a perfectly insulated instrument.

The aim of the Bottini operation is to burn a groove or grooves through the prostate into the prostatic urethra a determined distance, and, if possible, a desired depth. It is desirable and possible to do this in one operation, so that within a few hours and with only trifling hemorrhage the natural outflow of urine is restored.

I make no apology for rushing to report a single case. One good case well studied is often better than many. A more instructive case than this one may not for some time be found. It is the kind of case to prove a method.

The patient, M. C., aged 71, has been under my care occasionally for some years. Notwithstanding a well compensated double heart lesion (mitral regurgitation and aortic stenosis) he has enjoyed good health; he is now ably in charge, and has been for many years, of one of our largest and most important State institutions. Two years ago his urine showed normal specific gravity, acidity, color and transparency. It contained no albumin or sugar, and microscopically gave no evidence of vesical inflammation. At this time he had begun to urinate too frequently at night. In November, 1897, the following record of urine was noted: Sp. gr. 1014, acid reaction, light in color, slightly turbid, a trace of albumin; microscopically, mucus, uric acid, bladder epithelium, and a few pus-cells. Micturition had for some months become increasingly unsatisfactory and too frequent, in spite of strychnin and other medical aid. In January, 1898, urination became painful, the stream dribbled, the bladder never felt emptied. He began the occasional use of the catheter without my advice. I was rather inclined to delay the use of it until later. He gradually developed cystitis with much pus, being almost moribundly ill, with a tempera-

ture of  $105\frac{1}{2}^{\circ}$ , on one occasion in June, 1898. Proper catheterization and vesical irrigation ended the attack. He then more carefully attended to his catheter and performed self-irrigation not less often than every other day. His residual urine at this time, June, was 6 ounces; his bladder capacity under pressure 10 ounces; overflow, when allowed, every hour or oftener.

A rectal examination revealed a large, very firm, bulging mass, sensitive to pressure, dumb bell in shape on its under surface, with a large, thick, but latterly narrow isthmus between the ends. To the right, the finger passed to a sulcus in the rectum to the extreme right of this lobe. In the median line, the finger could not reach the upper limit, nor could the very large left lobe be outlined. A width of not under  $2\frac{1}{2}$  inches, and an upward extension in the median line of  $1\frac{1}{2}$  inches, would be a very modest estimate for these two dimensions. It was an uncommonly large prostate.

In September, 1898, the patient took a twenty-four hour's railroad journey, depending most of the time on overflow, a few times doing the best he could as to sterilization with his catheter. On his return, he was worse. From this time, catheterization, notwithstanding urethral and vesical sterile boric-acid irrigation, became more and more painful, often causing hemorrhage, and making him depend on overflow. With the bladder emptied and irrigated, he could go just three hours without urinating.

November 16, 1898 (while attending court), he held his urine too long. That evening he had a chill, and he also had another the following morning before I saw him. I found him with a temperature of  $104^{\circ}$ , and an intense pain in the back. His urine contained a large amount of pus. He was dangerously ill. For one week, his afternoon temperature never declined below  $102^{\circ}$ , in spite of diluents, urotropin, and careful urethral and vesical irrigation. In the second week the case was under control, the morning temperature reaching normal, the afternoon temperature never under  $100^{\circ}$ . On December 1st, after catheterization repeated every two hours, and followed by irrigation until apparently all pus was removed from the bladder, two ounces of urine were allowed to accumulate, and were drawn. The examination revealed the specific gravity

to be 1010; the reaction, acid; the appearance, cloudy; and the presence of albumin,  $\frac{1}{2}$  per cent.

The microscope discovered pus, mucus, a little bladder epithelium, a few round and oblong cells from the pelvis of the kidney, and a few purely hyaline casts. On December 1, 1898, the residual urine was 8 ounces. The character of the onset of this last attack of septic fever, the slowness of recovery under proper vesical irrigation, the fact that urine collected from an unquestionably cleaned bladder, contained pus and cells evidently from the pelvis of the kidney, as also a few hyaline casts, leads to the belief that on November 16th the infection traveled up one or both ureters.

The growing distress and the apparent increasing debility of the patient in spite of the passing over of the acute condition called for early relief from the prostatic obstruction. I had long ago advised against the usual operative procedures. A general anesthetic was positively contraindicated. I had lately, finally, appreciated, after careful study, the Bottini operation. I explained it to the patient, obtained his consent, sent for the instrument and decided to operate December 3d. I practised the necessary technic on the patient. On December 1st, without the use of cocain, the incisor was introduced into the bladder, and the beak hooked against the anterior lobe of the prostate. It was found impossible to turn the beak around either side to the rear. On December 2d the following method of using cocain was deliberately tried: After irrigation, the catheter was brought out until the eye was in the prostatic urethra. A syringe holding  $\frac{1}{2}$  oz. of a 2 per cent. sterile cocain solution was attached and a few drops placed in the prostatic urethra; the catheter was then pushed on and the remainder of the solution thrown into the bladder to bathe the prostatic surface and bas fond. In two minutes withdrawal of the solution was begun; in four minutes it was completed. I departed from the procedure of using about one dram of the solution, for the reason that the prostate and bladder were extremely sensitive, and I wanted the effect that volume only could give. Rapid withdrawal and immediate irrigation make the procedure safe, more so by far than when a dram is left in place and not removed. I had expected the cocain to shrink the

gland a little, and am certain it did, for before using cocain the irrigating fluid had returned clear; after using it I washed out considerable pus. What happened? The prostate shrank a little, and pus was expressed from the mucous membrane. On introducing the incisor the beak was made to easily and painlessly encircle the prostatic orifice, and the large bulging lobes were felt against the beak by traction on the handle. Operation on December 3, 1898. Everything sterile, the penis was washed, and the urethra and bladder were irrigated until fluid returned perfectly clear. One ounce of two per cent. sterile cocain solution was used, as above described, and the bladder was immediately irrigated, washing out considerable pus. The bladder was emptied, a sterile sheet with a small slit for the penis was thrown over the patient, and the incisor was introduced and its beak turned to point to the sacrum. A current strong enough to give a bright cherry-red color to the blade in six seconds was turned on, and the posterior incision, 3.7 cm. long, made in 35 seconds after the lapse of the six seconds. The knife was returned to the beak with a slightly stronger current in ten seconds. Making this cut and returning, in 45 seconds, a left lateral cut of 3 cm. was made, with turn and return of blade, in 40 seconds. An anterior 2.5 cm. cut was made, and the knife returned in 30 seconds. Actual time that the knife was in use at a bright red was 1 minute 55 seconds. Actual time from beginning of first incision to the end of the last cut, 3 minutes. The introduction of the incisor, the attachment for irrigation, the operation, and the removal of the incisor, occupied, in all, 5 minutes. A slight amount of blood escaped along the groove of the instrument during cauterization. For three hours after operation the urine dribbled. It was then passed voluntarily, at first very frequently, then at gradually increasing intervals. On the ninth day the bladder could hold four ounces, and pass it with a wide, forcible stream. On this day, also, an interval of three hours and forty minutes occurred between urinations. The longest interval for a year prior to operation was three hours, and then only after completely emptying the bladder with catheter and irrigating. Overflow in the same time had never occurred at greater intervals than one hour. The stream from the urethra is now

wider and more forcible than for three years. For three days following operation the temperature reached for a few hours daily  $100^{\circ}$ , which was considerably lower than it had been the few days just preceding operation. On the third day it dropped to normal, and has since remained so. It had not been so for months. The average quantity of urine for three days before operation was 30 ounces. The first twenty-four hours after operation it was 29 ounces. The daily quantity for the succeeding days was 32, 32, 36, 40, 40, 44, 45, 49 and 60 ounces respectively. With the increase in the quantity of urine passed from the kidneys the heavily coated tongue, distaste to and distress from food passed away, as did all evidence of the effect on the kidneys of septic absorption. The urine to-day (December 14th), has sp. gr. 1010, is slightly acid, cloudy, and contains a very small amount of albumin, less than  $\frac{1}{4}$  per cent. less than the day before operation, about as much as in October, 1897, before beginning the use of the catheter. It is possibly secondary to the double heart-lesion long existent. The patient is moving about freely, in better health than for over a year, apparently regaining rapidly the snap and vigor he was well known to possess over two years ago. His bladder has not been entered since the operation. I believe it empties completely. There is perfect satisfaction after urination.

I have regretted in the interest of the patient that this method of relieving the obstruction to urination was not more commonly in use, or that I had not as good a conception of it six months ago when there had as yet been no evidence of extension of the inflammation beyond the bladder. It is remarkable that such a conservative and, as results go, wonderful operation should have so slowly gained recognition. The early excuse, the nonperfection of the instrument and the lack of proper electrical appliances for obtaining a suitable current, now no longer holds. Some of the more recent results, repeated operations, and dribbling for a week or more, were not calculated to arouse enthusiasm. These results, if examined into carefully, will be found due to timidity in the length of the cuts, or, what is very much more probable, to the use of too low a heat in the knife. Most of the writers on this subject have advised the use of the blade at a cherry red. But cherry red varies. In my

opinion it should be a bright cherry red. With such a heat the incisions will be made more quickly, as in this case, and without more than very trifling hemorrhage. Too low a heat brings us near to where Bottini started. He charred not deeply with a dull cherry red blade. There was but little immediate loss of substance, too little; swelling almost to occlusion occurred, dribbling followed, and looked for results were delayed, often as long as thirty days. A heat strong enough to consume tissue will give space enough for voluntary urination to occur within a few hours and a wide space after a few days. Hemorrhage, too, is more possible from too dull a blade, owing to traction on the charred tissue.

The first operator in America to use this method was Dr. Willy Meyer, of New York. Before December 9, 1898, he had performed the operation 15 times on 13 patients (personal communication) with only one death immediately following the operation, which result he ascribes to acute sepsis. The patient, one of his early cases, was a very bad surgical risk; there is reason to believe the general anesthetic administered was an important factor. Certainly, results obtained after a general anesthetic should be separated from those after local anesthesia. It seems probable that the use of cocain solution in the bladder, freely but carefully as suggested in this paper and used in this case, will remove the necessity of general anesthesia in otherwise unmanageable cases. The second operator in America, Dr. Henry H. Morton, reported 5 cases September 17, 1898, all successful; he has now undoubtedly a larger number to his credit. Dr. Bransford Lewis, of St. Louis, and Dr. Leonard Freeman, of Denver, have been among the latest to report very successful results. Hardly less than 50 have been operated upon during this year in America, which in itself proves the great value of the method and the appreciation of it that has finally taken possession of the surgical world.

The indications for this operation are not yet as clearly understood as they should be. The contraindications, if there are any from the condition of the prostate itself, will probably disappear with the reports from the increasing number of cases. Freuden berg has stated it as his opinion that this operation should first be done on all cases where the obstruction is due to the hyper-

trophied prostate alone, and that other procedures should be reserved for failures from the Bottini operation. A large bulging posterior lobe, not acting as a dam, is held by some as a contraindication. It will probably be found not so. It would be well that a cystoscopic examination, if possible, preceded the operation, to determine just what is the condition of the prostate. If a large

posterior bulging lobe is found, it will require deeper cauterization; subsequent atrophy will remove enough remaining tissue. Besides, it is undoubtedly true that the collar around the urethral vesical orifice, and the thick encroaching tissue around the prostatic urethra, is chiefly responsible for obstruction. Deep multiple incisions, three, at least, should accomplish desired results.



## THE TREATMENT OF RETENTION OF URINE IN CASES OF ENLARGED PROSTATE.

BY H. M. CHRISTIAN, M.D.

Read December 28, 1898.

WHERE retention of urine depends upon the presence of an enlarged prostate it will occur in one of two forms, viz: (1) acute complete retention; (2) chronic incomplete retention.

In the first variety the retention occurs suddenly, and is complete—no urine being voided. The patient is seized with the attack in the midst of apparently perfect health, after exposure to cold or damp; or perhaps after excessive drinking of gin or whisky.

Constipation is not an unusual occurrence, and is an important factor in these cases.

Examination of the rectum will show in all instances marked enlargement of the prostate, but the gland will feel soft, as if very considerably congested. In fact, acute complete retention occurs most frequently in those cases where the hypertrophy is of the glandular or soft variety, such a prostate being especially prone to congestion, as a result of exposure to cold, intemperance or constipation.

In the second form, that of chronic incomplete retention, the retention does not occur suddenly, nor is it complete, the patient being able to pass some little urine, but in small quantities at frequent intervals.

The causes operating to bring about chronic retention are (1) gradually increasing obstruction to flow of urine produced by growth of the gland, and (2) corresponding loss of power in the detrusor muscles of the bladder, with consequent inability to empty the bladder, the result being the gradual accumulation in the bladder of residual urine. As this residuum increases in

amount the atony of the muscular coat of the bladder becomes more and more marked until finally all power to expel the urine being lost, the bladder overflows and there results a constant dribbling of urine, the condition known as, the incontinence of retention.

There is, I am sure, no emergency arising in the routine work of the general practitioner of medicine in which his responsibility to his patient is greater than in these cases of retention of urine occurring in men with enlarged prostates. Every genito-urinary surgeon knows that the life of men suffering with enlargement of the prostate, save for the discomfort occasioned by increased frequency of urination, is comparatively a comfortable one, so long as the bladder remains uninfected and the urine keeps sterile. Very nearly all of the cases of chronic cystitis in patients with this affection, seen by the writer, have dated the onset of their troubles to the use of a catheter to relieve an attack of retention of urine. Herein lies our great responsibility in the management of these cases, and the physician in attendance must exercise the utmost care in the use of the catheter in order that he shall not infect the bladder and thereby set up a cystitis which will be practically incurable.

In the treatment of retention of urine in cases of enlarged prostate, three things are absolutely essential: (1) The proper instrument for the purpose; (2) an absolutely clean and, as far as possible, sterile catheter; (3) a knowledge on the part of the physician of how such an instrument can best be used to accomplish the desired object.

*First.*—As to the proper sort of catheter.

It has always been a source of considerable surprise to the writer, in discussing this subject with the classes at the Polyclinic, to find how very little attention is paid to this matter of a catheter suitable in these cases of retention of urine, the impression being pretty general that any ordinary catheter will fully answer the purpose. It must, however, be borne in mind that the prostatic overgrowth, projecting, as it does, into the bladder, has the direct effect of elongating the urethra, the result being that the urethra will be found to measure from ten to fourteen inches in length, instead of eight or nine, the normal length. It, therefore, follows that the ordinary metallic catheter, measuring about nine inches, will utterly fail to enter the bladder in these cases.

This point was forcibly impressed upon the writer lately on seeing the futile efforts of a hospital interne to reach the bladder, in a case of retention due to enlarged prostate, with a ten-inch metal catheter through a urethra which was subsequently found to measure thirteen and one-half inches in length.

When under these circumstances, it is deemed advisable, or for want of suitable elastic instruments, it becomes a necessity to use a metal catheter; the only one suitable for the purpose is the long prostatic catheter with the "Benéqué" curve.

There are, however, two forms of elastic woven catheters that are much better adapted for this purpose, in fact are indispensable in the successful treatment of these cases. They are the Mercier, or single elbowed, and the bi-coudé, or double elbowed catheter.

I have no hesitation in saying that the physician with these most valuable instruments at hand can approach a case of retention due to enlargement of the prostate with the almost positive conviction that he will be able to enter the bladder and relieve his patient. Very rarely, if ever, will he find it necessary to employ the metallic prostatic catheter. The elbows on the end of these instruments are admirably adapted for the purpose of mounting or riding over any obstruction in the deep urethra caused by prostatic overgrowth.

The soft rubber catheter so often fails to enter the bladder, for the reason that it invariably doubles up upon itself whenever the tip of the instrument comes upon the

slightest obstruction or the least deviation in the axis of the urethra. The physician should therefore have at hand a coudé or Mercier and the bi-coudé catheter, and also a long metal prostatic catheter. These instruments should be of 18 or 20 caliber (French scale).

*Second.*—The catheters should be as nearly as possible sterile.

We are here confronted with a most difficult problem. As the material of which the catheters are made precludes their being boiled, it is almost if not quite impossible to have them absolutely sterile. But they can at least be thoroughly washed in a solution of green soap and hot water, and wrapped in bichlorid gauze until wanted. The writer has a long glass tube, shaped like a test-tube, in which he keeps his catheters, a rubber cork fitting tightly in the open end. By this means the instruments are kept clean and are easily carried about.

Dr. Edward Martin exhibited before the County Medical Society (*vide Transactions*) a very ingenious and handy device for keeping instruments sterile. It consisted of an oblong tin box, the size and shape of an ordinary corset box, containing a false bottom, in which was placed a quantity of paraform. Bacteriological investigations proved that the instruments in the box were sterile, and remained so indefinitely.

Whatever plan is adopted for the purpose of keeping catheters clean, it should be carried out thoroughly in every detail and at all times. They should at all events be kept apart from other instruments in a clean receptacle devoted to that purpose.

The third essential point in the successful management of these cases of retention of urine requires that the physician provided with a suitable catheter, thoroughly clean, shall be able to introduce it into the bladder and relieve the patient without inflicting any damage to the urethra or infecting the bladder. There is no special expert skill required in the use of the coudé or bi-coudé catheter. All that is necessary is that the catheter should be guided along the urethra into the bladder with a firm but gentle touch, no force whatever being required. This is more than can be said for the English catheter, armed with a stylet, which seems to be so popular among physicians in general. This instrument is capable of inflicting considerable damage in the deep

urethra, and in our judgment should never be employed under these circumstances. To prevent infection of the bladder is often a most difficult problem, as the urethra swarms with pathogenic microorganisms—and can never be rendered sterile. Before introducing the catheter, however, the urethra should be very thoroughly washed out with a solution of silver nitrate, 1 grain to the pint, several syringefuls of the solution being forced into the anterior urethra from the meatus. It has been demonstrated that this solution has the power of destroying the microorganisms in the urethra, and at the same time does not disturb the integrity of the mucous membrane. There is one more point of vital importance in the conduct of these cases, the neglect of which has cost many a man his life. *When called to relieve retention due to enlarged prostate never entirely empty the bladder.*

While genito-urinary surgeons have always recognized the importance of this injunction, I hardly think that its value has been fully appreciated by the profession at

large. This I gather from conversations with students in the classes at the Polyclinic. It was not so long ago that the writer heard a physician make the statement with the air of a man who had accomplished a great feat, "that he had removed forty-seven ounces of urine from that man." It would have materially prolonged that particular man's days in the land had only twenty-seven instead of forty seven ounces been withdrawn.

This rule is imperative and constitutes the only line of right practice in these cases so frequently seen of chronic incomplete retention, with atony of the bladder due to constant accumulation of residual urine. These cases present the clinical condition known as the incontinence of retention—or retention with overflow. Under such circumstances sudden withdrawal of all the urine in the bladder is sure to be followed by a profuse hemorrhage from the toneless walls of the viscus with a subsequent intractable cystitis, and very often by suppression of urine with death from uremia.

EXHIBITIONS  
OF  
CASES, SPECIMENS, PHOTOGRAPHS, ETC.,  
DURING  
1898.

March 9, 1898.

DR. J. M. FISHER exhibited a specimen of  
PLACENTA PRÆVIA,

saying he had been called to see the case late in the afternoon of that day, and the specimen being fresh he thought it might be of interest to the Society. The patient is 27 years old, the mother of two children, one born two years ago. The last pregnancy continued for a period of several months. About three weeks ago the patient was suddenly taken with profuse hemorrhage at 3 o'clock in the morning. The family physician was sent for and the hemorrhage was arrested shortly after his arrival. She had a second hemorrhage about a week ago and this continued for a half day. On neither of these occasions had the patient been subjected to extraordinary strain or to anything that might be regarded as a predisposing cause to the hemorrhage. She began to bleed again on the afternoon of the day preceding Dr. Fisher's visit and became progressively worse until his arrival twenty-four hours later. The patient was then very pale, almost exsanguined, and her pulse was barely perceptible and too rapid to be counted. Upon making an examination the cervix was found very well dilated and interference seemed desirable. There was a central implantation of placenta. The proper instruments were at hand, so Dr. Fisher loosened the placenta and detached it upon the right side, giving access to the fetal membranes. He immediately introduced axis traction forceps and drew the head down to the dilating os and at once arrested the hemorrhage. The fetus was delivered slowly in the course of one hour. The uterus contracted promptly, but the patient almost died. Restoratives and injections were employed with good result.

The great portion of the placenta was

attached to the left side of the uterus. The placenta was very much thinned in parts where it was attached to the lower segment of the uterus. Podalic version is generally recommended, but Dr. Fisher thought, taking everything into consideration in this case, that he arrested the hemorrhage more rapidly by applying forceps.

March 23, 1898.

DR. JOHN B. ROBERTS exhibited a case of  
EXCISION OF A SARCOMA OF THE TONSIL.

DR. HENRY W. STELWAGON exhibited  
PHOTOGRAPHS OF CASES OF LATE CUTANEOUS  
SYPHILIS.

April 13, 1898.

DR. JOHN B. ROBERTS presented a case of  
FACIAL HEMIATROPHY,  
and exhibited later a large  
CALCULUS REMOVED BY SUPRAPUBIC  
LITHOTOMY.

DR. AUGUSTUS A. ESHNER exhibited a  
patient with  
PROGRESSIVE MUSCULAR DYSTROPHY.

DR. EDWARD JACKSON exhibited sketches  
of a  
FOREIGN BODY IN THE RETINA, OF GLAUCOMA  
AND OF OPAQUE NERVE-FIBERS.

April 27, 1898.

DR. MORDECAI PRICE exhibited a specimen of  
EXTRA-UTERINE PREGNANCY,  
and reported the case:—

Mrs. S. had a few drops of bloody discharge at the end of the first month of

pregnancy. She was seen by Dr. Price in consultation at the sixth week. She then had all the symptoms of pregnancy. The nervous phenomena were well marked, the breasts were unusually large and painful, the vagina was excessively sensitive and the cervix soft and open; finally, there was on the right side a perfectly movable and very tender small mass. The diagnosis of the attending physician, Dr. Roderer, was extra-uterine pregnancy, while Dr. Price considered the pregnancy intra-uterine and the mass on the right side to be an enlarged and tender ovary.

From the sixth to about the ninth week the patient did well. She walked far and enjoyed her food. But from about the ninth week all her previous symptoms returned and in an increased degree. A black, bloody discharge also began to issue from the vagina and became constant.

At the end of the third month Dr. Price again saw the case in consultation and abandoned his own diagnosis for that of Dr. Roderer, and confirmed the correctness of the latter, on April 25, 1898, by an abdominal section and the removal of the product of pregnancy.

The tube was ruptured and free hemorrhage had occurred into the peritoneal cavity. The amniotic sac could be clearly demonstrated protruding through the rent in the tube. All other parts of the amniotic sac were covered by the distended tube.

Dr. Roderer incised the sac and the child was washed through the opening by the amniotic fluid. The child was fast to the placenta by the cord, and was not larger than a lima bean. Its life had evidently been destroyed early in the pregnancy, about the end of the first month. The placenta continued to grow until it ruptured the tube. The hemorrhage and pain necessitated action for the patient's relief.

In reporting this case, Dr. Price desired to call attention to the marked nervous phenomena that accompany a misplaced pregnancy; to the early discovery of the pregnancy by Dr. Roderer; to the fact that the child was still encapsulated in its amniotic sac; and, lastly, to the rupture of the tube directly into the peritoneal cavity and not in the broad ligament. The method of rupture in this case is in accord with that of all cases in Dr. Price's experience, and he said that this case, had there been no acci-

dent, would have developed to term in its amniotic sac.

DR. H. W. STELWAGON exhibited

A CASE OF FAYUS.

DR. EDWARD JACKSON exhibited

A CASE OF PURULENT OPHTHALMIA,

contracted by a nurse from a patient suffering with ophthalmia neonatorum. The infection led to perforation of both corneae and the nurse became practically blind. An optical iridectomy has given her useful vision in both eyes.

March 11, 1898.

DR. EDWARD JACKSON presented a card specimen representing the appearance produced by a

FOREIGN BODY RETAINED IN THE CORNEA

about eight weeks.

The possibility of such retention of a foreign body is not often mentioned in the books, and is not generally understood. Foreign bodies have been recorded as remaining in the cornea for even longer periods, as for 9 or 10 years. On close inspection a white spot can be seen which might be mistaken for the high light usually visible on the cornea, but which represents a vascular opacity. It is peculiar in its extreme whiteness, and is quite superficial. In this white mass the foreign body lay.

DR. G. BETTON MASSEY exhibited

TWO CASES OF CARCINOMA SUCCESSFULLY  
TREATED BY THE ELECTRO-MERCURIC  
METHOD.<sup>1</sup>

May 25, 1898.

DR. L. J. HAMMOND exhibited some photographs illustrating an

EXTENSIVE SYPHILITIC LOSS OF THE CRANIAL  
BONES

in one individual. Both parietal and part of the occipital and frontal bones were gone, and also the scalp that had covered them. This extensive local destruction occurred through lack of early treatment. The case was reported:—A female mulatto, aged 30, had a primary lesion eighteen months before treatment was instituted. When this

<sup>1</sup> See page 109.

was begun, she had a marked periostitis and incipient ulceration with caries over the area already described. She did not again report for treatment till two months later, when the bone was uncovered and sequestered necrosis was far advanced over both parietals. When next seen, some months later, both bones were so far detached that it was necessary only to lift them from the granulating dura mater. The cerebral tissues were exposed and pulsation was visible over the entire area. An effort was made to engraft the skin of a black pup. The grafts planted proved successful, but negligence on the part of the patient led to the abandonment of this procedure.

There was no lesion in any other portion of the body. The claim that necrosis in this region usually extends from a periostitis of the cervical vertebrae or from pharyngeal lesions is not exemplified in this case.

September 14, 1898.

DR. GEORGE ERETY SHOEMAKER presented a specimen of

CYSTIC DEGENERATION OF THE CHORION.

DR. SOLOMON SOLIS-COHEN exhibited

CASES ILLUSTRATING THE GOOD RESULTS OBTAINED FROM THE TREATMENT OF EXOPHTHALMIC GOITER WITH SUPRARENAL SUBSTANCE.<sup>2</sup>

September 28, 1898.

DR. ANNA FULLERTON presented two water-color drawings illustrating her paper upon

GONORRHEA OF THE UTERUS AND ITS APPENDAGES.<sup>3</sup>

She also exhibited specimens illustrating the great thickening of the tube and the involvement of the ovary produced by its agglutination to the tube, resulting in a secondary infection.

October 12, 1898.

DR. A. FERREE WITMER read a paper entitled

A CASE OF AMYOTROPHIC LATERAL SCLEROSIS,<sup>4</sup> and presented the patient.

<sup>2</sup> See page 161.

<sup>3</sup> See page 171.

<sup>4</sup> See page 179.

October 26, 1898.

DR. ROBERT G. LE CONTE exhibited a fresh specimen of

A HYSTERECTOMY, SHOWING AN ENLARGED UTERUS, A LARGE TUBO-OVARIAN ABSCESS OF THE RIGHT SIDE, AND A PUS-TUBE ON THE LEFT.

The patient was a German woman, aged 39 years, who had been treated for four months for some subacute form of endometritis with copious leucorrhea. Five weeks previous to admission to the hospital, the tubes were attacked almost simultaneously, as shown by severe pain in both sides, chill, fever, and sweating. On admission the temperature was 102°, and the whole pelvis was filled with an exquisitely tender, rather soft mass. Operation was delayed for a week owing to menstruation, and in that time the temperature fell to 100° and 99°. On opening the abdomen the tubes were found tightly adherent to each other and to the posterior surface of the uterus, the whole being surrounded with adherent intestine. The ends of the tubes were imbedded in Douglas's pouch. The operation presented no difficulties, more than careful handling, in order that the tubes should not be ruptured. Hysterectomy at the internal os was done because the uterus was considerably enlarged, had for months been the subject of inflammation, and the patient was near the menopause.

November 9, 1898.

DR. JOHN B. ROBERTS exhibited

THREE CASES ILLUSTRATING THE BENEFICIAL EFFECT OF PLASTIC OPERATIONS UPON THE FACE FOR THE CURE OF CICATRICAL AND CONGENITAL DEFORMITIES.<sup>5</sup>

November 23, 1898.

DR. E. BRUCE WENNER presented a specimen of

A PIECE OF OMENTUM REMOVED FROM A WOMAN 62 YEARS OF AGE.

It was the only part of her peritoneum that had not undergone fatty degeneration. The woman died from obstruction of the bowels produced by cancer of the head of the pancreas and of the whole head of the duodenum. All of the fiber of the pancreas that could be found was that existing in the exhibited specimen.

<sup>5</sup> See page 190.

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